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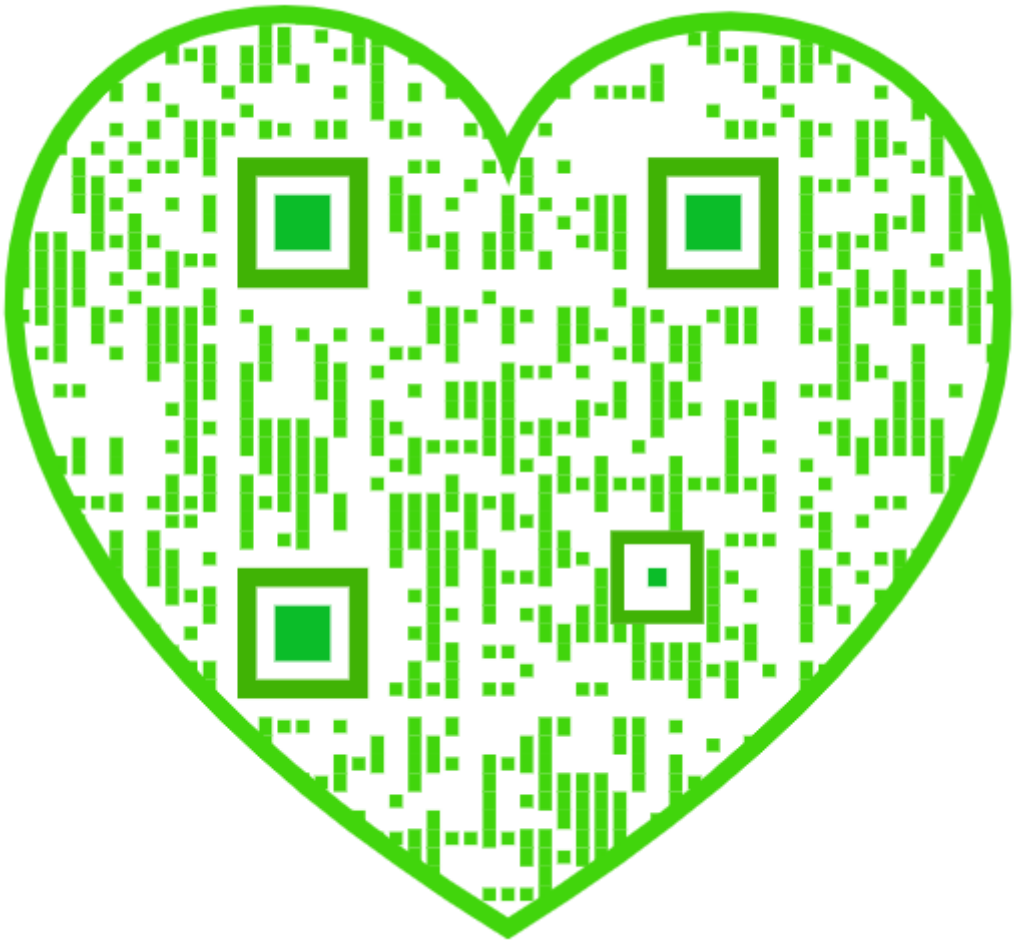

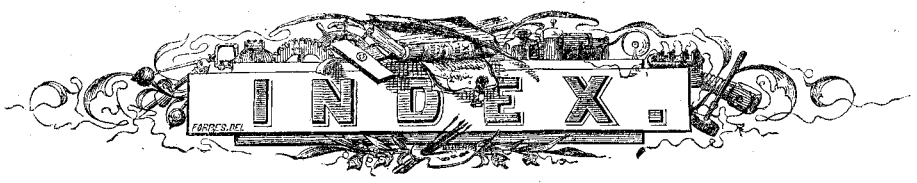

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SCIENTIFIC AMERICAN

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Improved Portable Photographic Apparatus.

The difficulty experienced by photographers in carrying, for outdoor work, a sufficient number of sensitized plates without exposure, has led the inventor to the contrivance of the apparatus represented in the annexed engravings. It seems to combine portability, convenience, and ease of manipulation.

Fig. 1 is a perspective view of the apparatus. A is the camera proper, and B the box for carrying the prepared plates, the two forming one compact contrivance which may be carried by the cords affixed to each side of the box. In Fig. 2 the apparatus is shown in longitudinal section. C represents the eye holes, which may becovered or uncovered by the diaphragm, D, turned by the thumb-knob, E. F is the slide for the lenses. At G, Fig. 3, is the ground glass plate on which the object is focused. This plate is movable for a purpose to be stated hereafter. The box or frame, B, on the top of the camera has on its sides a series of perpendicular grooves for holding the prepared plates, each one of which is secured in position by a thin strip of metal, like a spring, compressed against the edge of the plate by the screws, the heads of which are seen at the side of the holder in Fig. 1. Each one of these screws holds a plate ready prepared, and the only limit to the number is the size of the apparatus. Across the lid of the camera is a slit sufficiently wide to admit the passage of one of the sensitized plates from the holder to the camera. When it is desired to bring one of these plates into position the focusing plate, G, is retired from the snugs or supports in the camera, enough to allow the prepared plate to drop between the supports and the ground glass. This is done by means of a lever, H, which pulls back the spring, I, Fig. 2, and with it the ground glass plate. When the pressure is removed from the lever, the spring forces the plate, G, against the sensitive plate and holds it firmly in place until the image is formed.

In order to bring the prepared plates into position to drop into the camera, the holder, B, is made to slide upon the lid of the camera and is held to any point by the spring catches, J, Fig. 1, which engage with notches in metal strips on the edges of the lid, which are numbered, as in the engraving, to correspond with similar numbers on the heads of the screws in the side of the holder. The catches, J, are disengaged from the notches by the wedge shaped levers, K, so that the plate holder may be moved one notch. When the image has been fixed on the plate, the plate is returned to its compartment in the holder by simply reversing the apparatus, and retained by setting up the screw.

Practical photographers who practice out-door business as well as those confined to studio work will at once recognize the advantages of this combination. Application for a patent is pending through the Scientific American Patent Agency by David H. Houston of Cambria, Columbia Co., Wis., who will furnish any additional information desired.

Fig. 1.

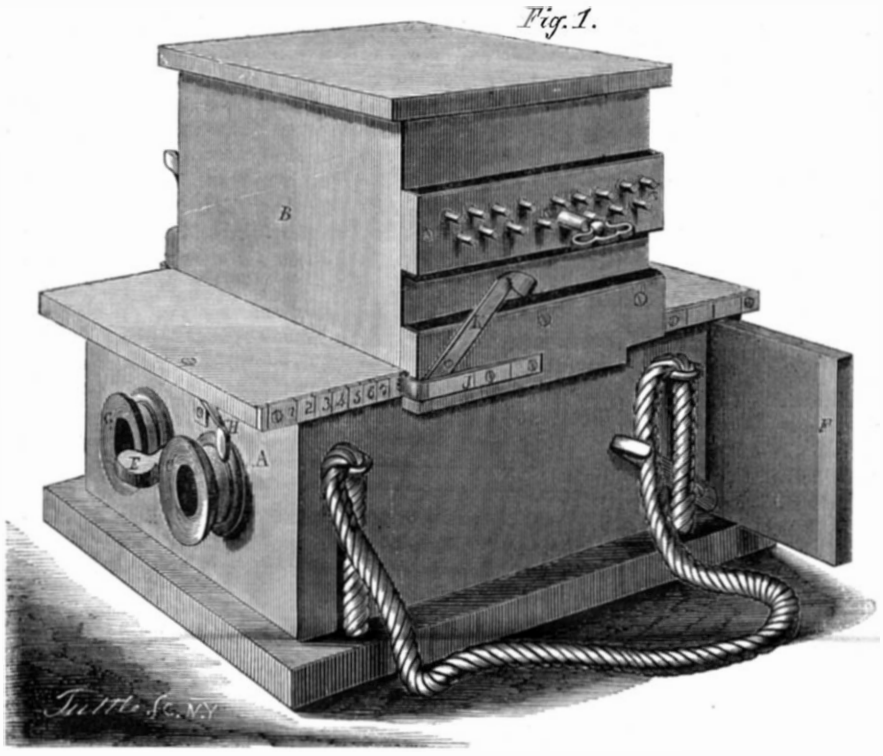
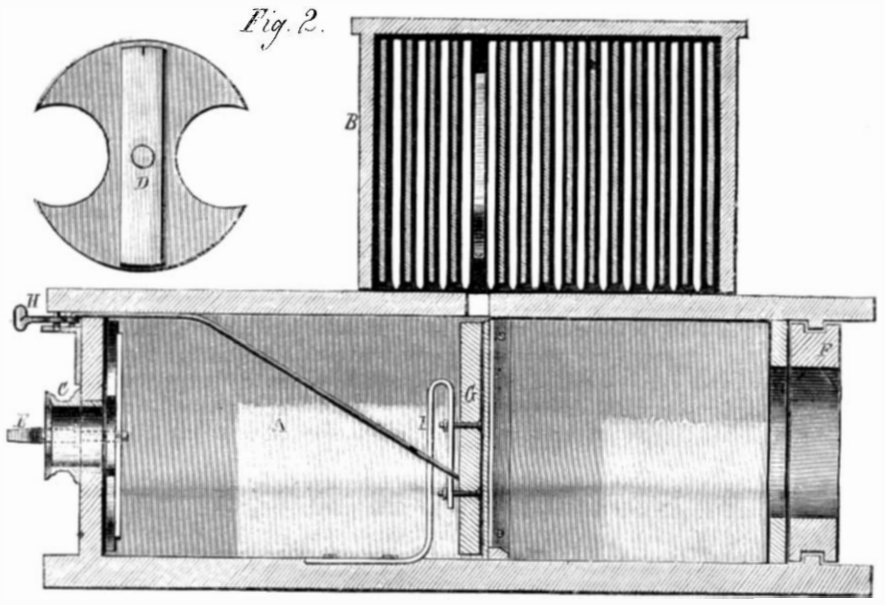


Fig. 2.



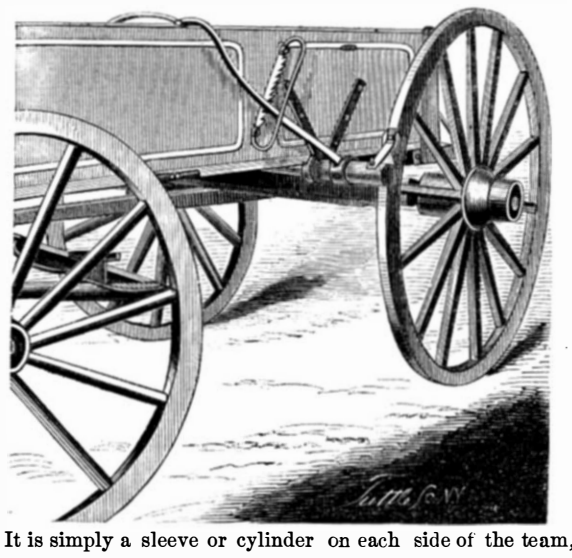
HOUSTON'S PORTABLE PHOTOGRAPHIC CAMERA.

THE CENTRIFUGAL GUN.

This gun was tried in our late war, failed as a moment's thought would have shown that it must, and is now having its day over again in Europe, and attracting considerable notice. It proposes by the turning of a crank, to hurl sixty to one hundred death-dealing bullets a minute. The question is, where is the power to come from? It seems to be supposed to reside somewhere in the crank, the gearing, or the balance wheel. It is the old inexpugnable dream of creating power out of leverage. If the machinery concentrates muscular power so as to enable a man to throw bullets with deadly force, it must more than proportionally diminish the number thrown. If he can throw twenty bullets a minute by hand, with one tenth the velocity necessary for fighting, a machine, wasting not over half the power, might enable him to throw one bullet a minute with the full force required, but without aim. A powerful steam engine, though not half as economical a motor for the purpose as gunpowder, might hurl from a fortification, quite a shower of balls at random: but if directed through gun barrels with accurate aim, it would be almost impossible to bring sufficient steam power to bear for any marked effect. What sort of a cylinder and piston would it take to project a 1000-lb. ball to a distance of two miles?

SCOFIELD'S WAGON BRAKE.

The operation of "backing," even on a level, is annoying to the driver and laborious to the horses of a team. Not less discouraging, and perhaps more dangerous, is the holding back of a wagon, coach, or any other vehicle—especially if heavily loaded—in descending an incline, as a steep hill. Certainly an efficient and easily operated brake, not unsightly, and never in the way when not wanted, would seem to be desirable. Such appears to be the contrivance shown in the engraving.



It is simply a sleeve or cylinder on each side of the team, near either the front or hind wheels, and turning on a shaft fixed to the body. To this cylinder is attached a properly shaped shoe formed so as to engage with the wheel, either on a curve corresponding with the circumference of the wheel, or on a curve which gives it a cam shape, so that when the pressure is upon the wheel the resistance of the brake or shoe shall correspond.

It may be held in position when placed, as well as operated, by the lever. It appears to be a simple device, cheap, effective, and substantial. The lever can be held by ratchet teeth, as shown, fixed on the side of the wagon. This device was patented through the Scientific American Patent Agency, March 26, 1867, by B. B. Scofield of Woodhull, Ill., who may be addressed for further particulars.

TRADE MARKS---THE LETTER "G."

The law of trade marks becomes a subject of increasing importance, corresponding with the progress of invention and manufactures in the country, and is rapidly assuming the fixed status which it long since attained under older governments. For, although an invention may be secured by patents against imitation in its substantial features, deceptive imitations of its form, appearance, and title or trade mark, are still possible and doubly injurious, unless prevented by law To render this protection more direct and certain, the growing custom of patenting designs and marks is very useful and will often save heavy costs in litigation. A fresh illustration of this subject appears in the injunction recently granted by Judge Daly against a party who had been selling sewing machines in the form of the letter G, which form is claimed by the Wilcox & Gibbs Sewing Machine Company as a trade mark. The inventor of the first in the series of improvements constituting the Wilcox & Gibbs machine (Mr. James E. A. Gibbs) gave to the machine by accident or design, the form of his family initial "G," under which it has since become famous. As there was no mechanical utility in the mere form, it was held that there could be no motive for imitating it but to profit by the reputation of the Wilcox & Gibbs machine, to the injury of the company's trade and reputation, and the deception and detriment of purchasers. The defendant was perpetually enjoined against making or vending any machine in this form, or in connection with this letter as a symbol or trade mark.

EDITORIAL CORRESPONDENCE.

The Trip to Paris—Something That Travellers Should Know—Novel Railway Signal—Cost of Living, etc.

PARIS June 1, 1867.

It was most exhilarating for us to catch the first glimpse of France after having experienced so much of the discomforts of the sea. Purgatory is defined by some religionists as a place where souls are refined after death. I think it possible that some people might derive this advantage from a voyage at sea: for my part I can think of no other. I desire to say a good word of the steamer *Pereire* of the French line, and also of Capt. Duchesne, her very skillful commander. This new line of transportation is rapidly gaining favor and, unless there are special reasons for visiting England, I should say that a voyage to Europe, making the first landing at Brest, would be generally the most comfortable; but I have such vivid recollections of the horrors of the sea that just now I feel inclined to advise Americans to stay at their comfortable homes. We made the passage in about nine and a half days, and on the morning of the 14th of May we entered the harbor of Brest, and were speedily transferred by a little steam tender, to the custom house, there to undergo the inquisitorial rummaging of trunks, satchels, etc. The distance from Brest to Paris is I think about 450 miles, and the run is made in 16 hours, in very comfortable cars, over an excellent railway, and through a country of much rural beauty—old Brittany, full of legends, and superstitions, and rude remains.

It was a charming sight to look upon the flowers in full bloom, and the crops of grain and grass which seemed to be

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rapidly preparing for the harvest; but the old rusty, thatched cottages of the peasantry, indicate anything but those comforts such as cluster in and about the homes of our American farmers. The presence of the French Government is immediately felt, the moment the foot touches the soil. At every station, even at the most insignificant ones, stands the policeman with cocked hat, epaulettes, and sword, a lazy lout, whose services seem as unnecessary as such a character would be at one of our country churches on Sunday.

Be it said to the credit of French railway management, that we made the whole distance without losing a minute at any of the stations, and reached Paris exactly on time. I suppose that no railways in the world are better built or generally better managed. Some of the French railways have recently introduced a very novel system of signalling to the conductor of the train when his services are especially needed. At first sight the contrivance resembles a small triangular looking glass, but upon closer examination a small ring is visible behind the plain glass. I give the translation of the instructions which passengers are expected to observe, as follows:—"Should any extraordinary occasion require the presence of the guard, passengers are requested to break the glass with the elbow, draw down the ring, agitate the arm through the right hand window, according to the direction of the train. Any passenger having called without reasonable cause will be liable to prosecution." Anything less than a murderous assault, I suppose would be visited by legal penalties. The idea of stopping a train of cars in this way strikes an American as very ridiculous. It will not do here to expose the bell cord where any one can pull it at pleasure; a Frenchman can't be trusted in that way. The absence of fuel and timber in the country distressed me. It is really a source of great weakness to the nation, the coal coming chiefly from Belgium.

I suppose that few of the readers of the SCIENTIFIC AMERICAN care for details of European travel. This whole business of telling what one sees abroad has been so thoroughly overdone in books, pamphlets, and newspapers, that I shall forbear many such details; but inasmuch as this is an exceptional year, when so many of our countrymen are coming here for the first time, I propose to jot down a few items of information which may be useful to a few inexperienced travelers. It is not now necessary to have a passport to land in France, but if a visit is contemplated to Austria and the Papal States a passport should be procured from the Department of State. A passport is handy in foreign countries, as with it and in case of trouble a call for assistance can be made upon the consular agents of the Government. On the voyage it is always well to be provided with good fruit, and poor clothes. The French government exercises no unpleasant surveillance over persons who land upon its shores, but the government is sensitive about the introduction of tobacco. It holds this trade as a monopoly, which now yields annually over $30,000,000 to the treasury. Americans cannot be blamed, if they love the noxious weed, for bringing their cigars with them, but they will save themselves a good deal of trouble by at once declaring what they have. Such a course will probably save all further examination of baggage. Another thing: travelers should be very cautious not to offer money to the Custom House officer. The French people are always eager to get money, yet in this particular service the officer well knows that it would be extremely hazardous for him to accept a gratuity. If a duty is paid on tobacco, a receipt should be taken, as upon reaching the barriers of the city of Paris, the presentation of this receipt will usually prevent another examination. The city of Paris collects an *octroi* or entrance duty upon wine, wood, fruit, beer, verjuice, oil, cider, sausages, and all other articles consumed by the people. These sources of municipal revenue yield nearly $20,000,000 annually. Americans will feel extremely awkward in France without a tolerable knowledge of the spoken language. One may soon pick up enough French to order a cup of coffee or a beefsteak, but this does not serve the sight seeker, who will be naturally curious to know something more of the numerous objects of interest than can be gained from guide books. These guide books necessarily glide flippantly over many objects that possess a deep historic interest, and which cannot be discovered by the optical sense.

Unlike New York and other American cities, the visitor depends mainly upon the public carriages to be transported from place to place. The city rail car has not yet been licensed to monopolize and destroy the beauty and comfort of the streets of Paris. There are now over 10,000 of these public carriages in constant use, and 10,000 more would now find employment. A French cabman knows nothing at all of our language and does not care to know. It is for his interest usually to pick up strangers who are mainly ignorant of what they really want, and therefore most easily gulled. To take a cab by the course is an easy thing, but one must learn by experience that every stop, if ordered but for a moment, doubles the fare—makes another course. If by the hour, the traveller is at once overcome by the melancholy sensation that he is journeying toward a burial ground. A tolerable knowledge of the language and a few *sous* usually operate to hurry up the driver, but if one must needs sit dumb like a piece of statuary, the whole thing becomes extremely oppressive. An American may swear and scold as much as he please, it will fall upon the cabman's ear like music.

American ladies should not leave home without providing themselves with a good outfit. The stories about cheap clothing and ready-made trappings for ladies are dreams of the fancy, at this time especially, and are kept in circulation for the purpose of filching the pocket. Whenever it is known—and the fact gets current in some way very quickly—that an American lady lands in Paris not clothed, an army of milliners, dressmakers, chemisiers, shoemakers, dealers in laces, shawls, night caps, shoes, shoe blacking, etc., beseige her lodgings and bring to bear all the refined arts of prevarication and polite swindling. The trial is excessively annoying and my experience is that it does not pay.

The prices of every necessary article are very high in Paris, the city is thronged with strangers, and Americans who come here expecting in some way to live cheaper than at home will be disappointed. For instance, the price of the rooms at the *Hotel du Louvre*, where I am now staying, were to day advanced twenty-five per cent. I understand that it is very general throughout the city. I have now one room that accommodates me very well, for which I pay $7.50 per day, all meals extra. A good beefsteak 50 cents, cup of chocolate 45 cents, coffee the same, which includes bread, a sperm candle 20 cents, a plate of asparagus 80 cents, and besides, almost every man and woman you meet expects you to give them something extra; for genteel begging is done here to perfection.

The above are first class prices, but will generally serve as a guide to those who expect to eat something besides horse-meat, thin vegetable soup, boiled sorrel, or bread and coffee. A common one-horse carriage, drawn by an uncommon horse, can now be obtained for $8 per day, besides an extra dollar to pay coachman's "drink money;" total abstinence people take notice. I will however drop this subject, as I remember the old saying that "no one ever learns anything from the experience of other people."

There is a wonderful stir in the streets to day and all Paris is alive with interest. Squads of policemen are moving about the streets, mounted guards are hurrying to their posts, along the line of the principal streets the flags of various nationalities are floating from the windows. It is quite noticeable that the flag of the United States is very prominent. As I now write the Emperor of Russia is landing in Paris and the Emperor Napoleon with his retinue has gone to the station to meet his illustrious visitor. I must drop my pen, as in a few minutes the cortege will pass, and I wish to get a look at the Czar who has been so good a friend to our country.

S. H. W.

Special correspondence of the Scientific American.

TRIAL OF AGRICULTURAL MACHINERY---SUCCESS OF AMERICAN INVENTIONS.

PARIS, May 24, 1867.

The jury on agricultural machinery, seem determined to to award their prizes on some more definite information as to the merits of the various implements exhibited, than is to be obtained by a merely superficial examination of them as they lie in the annexes. For this purpose they have arranged to have a series of competitive trials on the Emperor's farm at St. Cloud, and the results of these will be the basis of their awards. The first of these trials, which took place yesterday, was between the horse mowing machines. Quite a large number of gentlemen and some ladies were on the ground, and had the day been more agreeable, it would have been a very enjoyable excursion. The ground chosen for the operations of the machines, was a large, tolerably level field, grown over with a much larger proportion of weeds than grass; in addition to which, the recent heavy rains had made the soil into a paste of about the proper consistency for brick making, and as the grass was full of high, clayey ant hills, it was quite apparent that it was the intention of those who selected the field, that the capabilities of the machines for rough work should be fully put to the test. About fifteen or sixteen machines of different manufacturers, French, English, and American, were on the ground. The field had been divided by previously mowing straight and parallel swarths into the same number of exactly equal patches, containing about two acres each. No difference in the character of the ground could be distinguished, and I heard no complaints of unfairness in the trial. At a given signal, the first half of the machines began their work. Among these were W. A. Wood's, Hoosic Falls, N. Y., Howard's, (English), and some French and other machines. The unfavorable nature of the ground was soon apparent, as some of the machines were obliged to stop to clear their gearing before they had gone fifty yards, while none completed the first swarth without having to stop. Howard, who has already taken the grand medal for agricultural machinery, having by far the finest collection of tools in the Exhibition, although an Englishman, has made himself very popular with Americans by a very candid report, which he had the manliness to make before the Farmer's Club on his return last fall from a tour in the States, where, unlike many, he was able to see evidences of peculiar genius among our people. The machinery which he had on trial was of an American pattern, (Marsh's), the patent for which he had purchased, but improved by him, and called the Howard mower. It was drawn by a magnificent team of horses—a pair always seen at trials where Mr. Howard is a competitor, and the majority probably expected that he would carry the day, Howard's and Wood's machines, both nearly completed the first swarth before they were obliged to stop, but Wood got under way again much more quickly than Howard, and had cut his return swath before Howard had finished his first. One of the French machines, even at this early stage, withdrew from the contest, having been unable to cut half of its first swarth. It was immediately apparent that the competition among the number now in operation, would be between Wood and Howard, and the odds were already much in favor of Wood. As the mowing progressed, these indications were confirmed, and before any other machine was half through, Wood had cut down all his patch—the time occupied having been ninety-four minutes. Like all the other machines, this one was obliged to make numerous stops to free itself from dirt and clogging; but these were not so frequent nor as long as those of its neighbors.

After the jury had had time to examine the working of the first set of machines, but before these had completed their work, the second set were put in motion. Among these were a one-horse American machine, called the Clipper Mower, which, before the start, elicited a good deal of praise from the spectators. The Perry Mower, also a favorite, on account of its simple construction; a Seymour & Morgan machine of French construction, and a McCormick mower besides other English and French machines. The difficulties experienced by these were quite as great as those of the first set. The Clipper Mower disappointed its admirers by the bad work which it did, cutting too high and imperfectly. The Perry Mower got on pretty well, though it broke off its track clearer in turning around at one end of the field. The Seymour & Morgan machine was a combined reaper and mower, and was the only machine having a reel in front of the cutter. At first sight, owing to its combining so much in one machine, it appeared rather complicated in comparison with its competitors, but until near the end of the trial it appeared to be doing quite as well as any of the others. When it came to its last swarth, however, it had great difficulty in making any progress, and was obliged to stop at every step, and at last had to relinquish the attempt to finish. The McCormick machine was the only one of the second set that was able to complete its patch, and occupied in so doing, 2 hours and 13 minutes: or 39 minutes longer than Wood's machine had taken.

It is stated that a second trial will be given to Howard's, Wood's, Perry's and McCormick's machines, as the former was finally diabled by breaking off three guards in a clay-hill, and the Perry was also partially injured by losing its track clearer. The grass for this next trial will, perhaps, be of a closer and better quality also.

It will thus be seen that as a whole, the trial was exceedingly severe, and the Americans may take the credit to themselves that the only two machines that were able to get through with their work, were Yankee machines, and the four which are to have a new trial are also American in design.

Another trial will also be had subsequently, in which the dynamometer will be applied to ascertain the amount of tractive force required.

Similar trials, it is understood, are also to be made with plows and other agricultural implements. If, however, the competition is extended to steam plows, &c., we shall have to fall out of the ranks, as we have none on exhibiton, and the French and English will alone compete.

SLADE.

Repairs of Rails.

By the kindness of Mr. W. A. Herring, C. E., of the Mississippi Central Railroad we are furnished with a letter from the General Superintendent of the Wilmington and Weldon (N. C.) Railroad detailing his plan for repairing worn-out rails. It contains information which may be of use in many parts of the country.

W. A. HERRING, ESQ.—*Dear Sir:* Your letter of the 3d of March, came to hand a few days since. You desire to know what has been my experience in railroad mending, the process, etc. I take pleasure in replying. I consider the rail mending operations on this road second only to that of repairing engines and cars. It is certainly of the greatest importance to all railways located as this is, far from rolling mills and iron markets. The saving in repairs of track are very considerable.

The cost of mending or repairing rails we had reduced before the war to about seven dollars per tun, and by the process we reclaim rails that will wear half as long a time, and sometimes two thirds as long as new ones. I speak of the average durability of new and repaired rails. Some of the repaired rails may not wear more than one or two years because there are other defective places along the rails that afterward show themselves; but the average service they will perform is not less than five years with us and new ones will not average more than ten years.

I may therefore say that the average durability of mended, welded, or otherwise repaired rails will last about half as long as new ones. The process is simple and will suggest itself to almost any blacksmith. We have an anvil or swage block, sometimes called a vise block, by means of which the rail is formed after the welding process is completed. The mending consists in trimming off all the bruised and laminated parts of the rail ends, or in the middle when the rail has been crushed, and then, after fitting a flat piece of iron to the place that is to be mended, we take a welding heat on both parts—rail and flat bar—and as they come on to the anvil lay on the patch and weld it up, all at one heat, and shape and trim the rail. If the work is properly done, the repaired end outlasts any part of the rails. We also cut rails and take two pieces, say ten to twelve feet long, cutting out the defective parts, and weld them together, thus making a complete and frequently a long rail. Cut the ends to be welded in the shape of a fish's mouth open, and place them together in the furnace, and as the iron reaches a welding heat the ends of the rails are struck and thus driven together and welded in the center; when this is sufficiently firm, the rail being connected, it is drawn on to the anvil, and the lips hammered together strong and secure, and formed in the swage block. I have tried the strength of rails thus mended, and have very seldom found them defective; never unless the iron is burned in the process of welding or the welding is imperfectly done.

I believe I am the originator of this operation (welding two rails together) as I had never seen it done before. We have found very great economy in the operation. This road could not have been kept in running order during the late civil war but for this mending operation; and we then carried the mending to a much greater number of rails than we would have done could new rails have been obtained at any reason-

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able price. The cost of furnace and anvil complete is from $100 to $150. You need a good blower for your furnaces. We use a large sized fan blower to drive our foundery—seven smith fires and four rail furnaces—and have plenty of blast.

You can easily calculate the saving to your company by mending rails; the cost is not more than ten or fifteen dollars per tun, say not more than sixty cents for each end welded up for the labor, with fifteen cents for the iron and coal consumed in the operation. We use either bituminous, or anthracite coal, but prefer anthracite; the old scrap about your shops will do for patches. Therefore if you mend both ends, and it takes seven rails for a tun, you have but $10.50 for fourteen ends, or one tun of rails. But frequently only one end wants mending, and then again I charge in my estimate the cost of hauling the rails to and from the shop.

I will give you any further information in my power on this subject at any time. I am, very respectfully, yours,

S. L. FREMONT, Chief Eng. and Gen. Supt.

Type Writing Machine.

A machine by which it is assumed that a man may print his thoughts twice as fast as he can write them, and with the advantage of the legibility, compactness and neatness of print, has lately been exhibited before the London Society of Arts by the inventor, Mr. Pratt, of Alabama. He draws up his alphabet in a solid square battallion, say seventy characters in seven rows, the whole in a solid electrotype plate about five-eighths-inch square or more according to the size of type desired. He prints a letter by the blow of a minute hammer of uniform size with all the type bodies, striking the face of the letter, with the paper interposed, and a carbonized sheet also between that and the type. Each letter, as wanted, is moved into position before the hammer by compound levers actuated by keys like those of a piano. The same touch of the key readjusts the paper to the new impression (with or without a space before it, according to the force used), readjusts the type plate so as to present the desired type to the hammer, and gives the printing blow. Simple arrangements also retract the page at once laterally and vertically to begin a new line. The type plate and paper are placed vertically, the latter with its face to the operator, so that the work done is before his eyes as in writing. The keys actuate two double-acting levers, one of which raises or lowers the type plate, while the other moves it laterally. Each key is so applied to the levers as to adjust the plate at once sideways and vertically to the position for bringing a particular character into play. Or, a better way, one key will do duty for the vertical movement of each entire horizontal row, another key for the lateral movement of each vertical column; and thus by pressing two keys for each character, seventeen keys will be sufficient to operate the whole font of seventy characters above supposed. The case of the instrument is small and compact, the parts are mostly of wood, and it could be manufactured and sold on a large scale for about $15 with a handsome profit.

The subject of type writing is one of the interesting aspects of the near future. Its manifest feasibility and advantage indicate that the laborious and unsatisfactory performance of the pen must sooner or later become obsolete for general purposes. "Printed copy" will become the rule, not the exception, for compositors, even on original papers like the SCIENTIFIC AMERICAN. Legal copying and the writing and delivery of sermons and lectures, not to speak of letters and editorials, will undergo a revolution as remarkable as that effected in books by the invention of printing, and the weary process of learning penmanship in schools will be reduced to the acquirement of the art of writing one's own signature and playing on the literary piano above described, or rather on its improved successors.

A Great Iron Floating Dock.

An immense iron floating dock for ships of the largest class is now building in England on a novel plan (patented), for the service of the Government at the naval station of Bermuda. It is proposed to tow the enormous mass (380x123x72 feet) across the Atlantic. It is constructed of a semi-cylindrical form, like a ship, in six series of longitudinal compartments, viz: two series in the bottom, to be kept empty, one series on each side, at midhight, as balance water chambers; and one series on each side, at top, as load water chambers. The water chambers are kept full, and the dock thereby sunk, when not in use, and all is thus ready for the immediate raising of any vessel at a moment's notice, without the use of pumps or machinery. The vessel having been towed into the dock, without closing the ends, the gates are opened in the upper load chambers projecting above water (by the weight of which the dock is sunk) and they are emptied into the sea. The dock and vessel are thus raised sufficiently to permit (the ends being then closed) the remaining water in the dock to be drawn off into the air compartments in the bottom, leaving the dock clear for the workmen. Afterwards, at leisure, the water is pumped out of the bottom compartments into the load chambers at the top of the sides, for the next occasion. For docking small vessels, hollow floats or pontoons, fitting the bottom interior of the dock, are proposed, which will be emptied as above into the bottom air chambers, and will then be floated out with their load, making room for other vessels. By emptying the water chambers on one side only, the dock can be easily careened for repairs.

The Petroleum Trial.

The first experimental trip of the *Palos*, June 14th, with petroleum as fuel, resulted in a total run of 25 nautical miles in 1 hour and 55 minutes, or a little over 13 knots an hour. The reported result is almost incredible, as the *Palos* is only an 8-knot steamer, with coal. Four barrels of oil were consumed on the trip, doing the work of eight tuns of coal. The oil drips into a hot iron retort, where it is converted into gas and mingled with steam and air in exact proportions to produce entire combustion and the most intense heat, which is distributed to the heating surface of the boilers with such effect as to raise steam in 25 minutes, where three hours were required with coal. Such is the case thus far, as made out by the friends of the improvement.

We add the following letter from Engineer Alban C. Stimers relative to this interesting trial and the subject of petroleum for fuel. It was addressed to the New York *Times*:

NEW YORK, Monday, June 17, 1867.

I observe in your editorial remarks in Minor Topics, in adverting to the Boston petroleum fuel experiments, in this morning's paper, an inquiry regarding the "original source of the steam that is taken from the boiler and passed into the retort that generates the vapors that make the heat that raises the steam in the boiler."

Having closely observed the various efforts made during the past five years to employ petroleum in lieu of coal for a steam fuel, I take the liberty to offer the following explanation in reply to your inquiry.

The introduction of superheated steam into the retort where the oil is vaporized is not essential to the making a fire and getting up steam, but it is to burning said vapor with the completeness of combustion necessary for it to compete with coal as a steam fuel. In burning the vapors of petroleum it is necessary that every particle of the vapors shall come into close contact with a corresponding particle of atmospheric air; but air and the vapors of the oils appear to have the same repellant qualities as oil and water, and do not mix enough to prevent the formation of a thick black smoke, and the heat developed is comparatively very small.

All who have attempted the use of petroleum for a steam fuel, appear to have early learned the great advantage of introducing superheated steam to the vapors. When this is done, the air mixes readily with the compound, and a more complete combustion is effected.

Although, as I have already stated, steam could be raised in a boiler from burning the oil vapor only, yet it is done much more quickly and pleasantly if a supply of steam can be had, and I observed that on Friday last the fires of the *Palos* were assisted with steam from a sister vessel, the *Leyden*, which lay alongside.

The first experiments tried to test the practicability of employing petroleum for generating steam were by Shaw and Linton, in Philadelphia. I was member of a Board of Naval Engineers, ordered by the Department to conduct and report upon the experiments. They continued during five months, and our report is dated May 5, 1863.

In that arrangement, "the apparatus used was an ordinary tubular locomotive form of boiler containing fifteen tubes, two inches in diameter and fifty-six inches in length; a small steam engine, in connection with it, operating a pump supplying water to the boiler; with an additional boiler of very small dimensions, placed in a heating apparatus, to provide a steam jet, previous to firing up with the oil, in the absence of other means for procuring the necessary artificial draft until steam was raised in the larger boiler."

This would be a good arrangement for Colonel Foote to employ with his process. The great merit of Colonel Foote's process over all those which have been tried in this country and in England, consists in his forcing the air, necessary for the combustion of the oil, directly into the retort where the latter is vaporized, and as super-heated steam is introduced simultaneously, *the air becomes thoroughly mixed with the vapors before they issue from the burners* and the combustion is consequently perfect when the proper proportions of air and oil are maintained. This desideratum is never attained in any other process yet brought to my attention.

When an inventor comes to me and describes the brilliant white flame which he produces with his greatly improved petroleum burner, I know that he cannot compete with anthracite coal in economically generating steam. And Colonel Foote is the only one who has shown me a fire where all that was visible was the blue hydrogen flame, which every chemist will understand is—with such a combustible—the hottest attainable fire.

Editorial Summary.

IMPROMPTU HAT.—A French machine in the Exposition exhibits the manufacture of a finished felt hat, ready for use, in fifty minutes. The first operation consists in blowing out, by means of a fan, about four ounces of rabbit's fur upon a revolving cone or mold of copper, pierced with holes, from which the air is exhausted, causing the fur to adhere to the cone. It is then covered with a wet cloth and steeped in a tub of hot water for a few minutes, after which it undergoes the processes of drying, heating, rolling, binding, and lining with silk, and comes out a perfect hat.

INTERESTING ARCHÆOLOGICAL DISCOVERY.—Sir Henry Rawlinson has recently succeeded in uniting and thus completing two separate portions of an Assyrian record covering 243 years of the empire, one of which is the year of the computed eclipse of the sun, 763 B. C. This event is distinctly noted in in the record at a date varying not over 40 years from Archbishop Usher's chronology. The genuineness and authenticity of the record, the accuracy of the reading and translation, and the correctness of the chronology computed from the Hebrew Scriptures, are all established at once, by their coincidence with a fact, demonstrated by modern astronomy. The record was upon two separate blocks in the British Museum, the one containing the names and the other the dates, and not hitherto supposed to have any connection with each other. We have now but few chapters in the history of ancient nations written out so authentically and accurately as that of Assyria at this period, from the time of Benhadad and Ahab nearly to Josiah.

MISCELLANEOUS.—The report of one of the British Railway Commissioners, Sir Rowland Hill, states that the personal injuries on all the railways in the United Kingdom are fewer than those by ordinary vehicles in London alone. ——De Suca, having examined the water of the vase at Pompeii, shows that it had not remained there, as supposed, for eighteen centuries, but was a deposit of filtration from heavy rains.

BALMORAL skirts are now manufactured of felt.

CINCINNATI has several furniture factories on the co-operative principle The Cabinetmakers' Union, established in 1852, paid in 1866 $13,000 of profits and $13,000 in interest. The Queen City Company was established in 1861 with a capital of $10,000; the Cincinnati Association started in 1863, has a capital of $10,000; the Central Association, incorporated in 1866, has $20,000 capital.

LIEBIG'S ARTIFICIAL MILK is an imitation, as close as chemistry can make, of the natural food of the human infant. It is prepared as follows: Half an ounce of wheat flour is boiled to a paste in five ounces of skimmed milk. To this is added immediately a mixture of one-half ounce of bruised malt, one ounce of water, and three grammes of a solution of two parts of bicarbonate of potassa in eleven parts of water. The whole is then kept warm by standing within an envelope of tepid water until it is no longer pastry, but of a creamy consistence. After fifteen or twenty minutes it is put on the fire for a few seconds only, and then strained through a fine hair sieve. It should be allowed to stand long enough to deposite some fibrous matter before it is given to the child or invalid.

A CURIOUS CHEMICAL OBSERVATION.—Becquerel, senior, has found that chemical decomposition and combination take place actively and with peculiar results, between two solutions connected by an inappreciable fissure, or water-tight joint. A tube with such a fissure in its bottom, being filled with a solution of nitrate of copper, none of the liquid pours mechanically; but on immersing the bottom of the tube in liquid proto-sulphuret of sodium, an electrical action takes place, and a double decomposition and recomposition ensues, indicated by the appearance of crystals on both sides of the fissure, which are not always of the nature required by theory, but are modified by the capillary action of the surfaces.

TIN FOIL is generally manufactured with an analogy to the new lead-cased tin pipe, by enclosing an ingot of lead between two ingots of tin, and thus rolling them. The "pure" article, according to a writer in the *Pharmaceutical Journal*, has been found to contain 34.62 per cent of lead, and the common, 86.93 per cent.

FILES.—M. Taborin, one of the oldest French manufacturers of files, has contributed two sums of 3,000 francs each, toward prizes to be offered by the Academy of Sciences for a file-cutting or file-forging machine.

ANOTHER OXYGEN PROCESS is reported in the *Chemical News*. On heating a concentrated solution of chloride of lime, with only a trace of freshly prepared moist peroxide of cobalt, the hypochlorite of lime was completely decomposed into chloride of calcium and oxygen and no chloric acid was formed. The evolution of oxygen commences about 70° or 80° and continues in a regular stream, with a slight frothing of the liquid. The peroxide made use of in one experiment may be employed again to decompose a fresh quantity of hypochlorite of lime.

A STEAM HORSE, OR A HORSE LOCOMOTIVE?—Mr. Stamm, of Milan, has made a vehicle in which the strength of a horse is re-inforced by that of steam, while the steam power gains in application the advantage of the horse's intelligence, so that both work together and are managed as one by the reins. When the horse moves forward, his traction applies the steam; when he is pulled up, his backward action shuts it off, and if rigorously applied, reverses the engine, which backs as he backs, stops backing as he stops, and again starts forward as he starts.

HANGING GATES.—An engineer in India, where gate-posts find proverbially insecure bearings in the deep black soil, suggests a mode of hanging by which the strain of the gate's weight would be transferred from the top to the bottom of the post. The shank of the top hinge passes loosely through the gate post and fastens in an upright lever behind it, which hinges to the bottom of the post beneath the ground, and has its fulcrum against the post near the ground. The weight of the gate thus pulls on the upper end of the lever and pushes against its fulcrum near the ground, shortening the leverage of the strain by the whole distance between the two hinges of the gate The whole pressure against the post is exerted close to the ground.

HYDROGEN has been collected from meteoric iron by Mr. Graham, to the amount of nearly two and a half times the volume of the metal. The iron of our planet is characterized by a predominance of carbonic oxide in its contained gases. Hydrogen having been recognized by means of the spectrum as the principal element of a numerous class of stars, the two evidences point to the origin of the meteorite in a dense atmosphere of hydrogen. Under the pressure of our atmosphere, it has been found difficult to impregnate iron with more than an equal volume of hydrogen.

CHESTNUT OIL, prepared on a large scale, in France, from horse chestnuts by chemical treatment, is very fluid, absorbable by the skin, and has met with great success as an application for gout and rheumatism. Stearin, syrup of glucose, alcohol, and starch are also among the incidental products.

MARINE SILK.—A Frenchman has found in the eggs of fishes of the family of sebacians (the ray), the exterior envelope is a tissue of filaments which are easily separated and manufactured into silk. The exterior also contains a white albuminous substance which answers the purpose of whites of eggs for printing on tissues.

ARTIFICIAL STONE is in greater favor with the French than with any other people. They are even using it in enormous blocks of over 120 tons weight, in building the new works in the harbor of Brest, called the "Port Napoleon." The material consists of rubble-stone, Portland cement, and sand. The blocks are lowered into position as foundations in the water, being constructed with wooden blocks in the interior, near the four corners of the upper face, into which iron suspension pivots are inserted. Artificial lithographic stones are also made for presses which require cylindrical stones of larger size than are easily obtained from nature.

DENSITY OF OZONE.—M. Soret has proved the density of ozone to be one and a half times that of oxygen, by the test of diffusion, the relative velocities of names correspond to the theoretical calculation on the assumption of the ab proportion; as well as by comparisons of volume, in which it is found that by converting ozone into oxygen, its volume is increased one half.

NEW ANILINE DYES.—Three new and distinct coloring matters have been reduced from the residue of the manufacture of rosaniline, to which have been given the names of mauvaniline, violaniline, and chrysotolindine.

THE STEEL-FACED COMPOUND ARMOR PLATES, made by Charles Cammell and Co., of Sheffield, bore a notable test at Shoeburyness on the 14th ult. The plate was of two and a half inches thickness of a special hard steel, welded with four and a half inches thickness of iron without backing. The 7-inch Palliser rifled shot, weighing 117 pounds, entered the plate at right angles and stuck, with its point just through at the back. Fired obliquely, the shot broke up. John Brown & Co,'s plates of the same construction let the shot clean through.

SILVER INLAYING.—A cheap and simple process recently published consists in first engraving with nitric acid or otherwise the metallic surface to be inlaid, with the desired pattern, and then rubbing into the depressions a little moistened nitrite of silver. When perfectly dry, the metal is heated until the nitrous acid is driven off, and the metallic silver fills the hollows in a spongy mass. This must be rubbed down and compressed well into the engraving with a burnisher. The silver thus inlaid adheres inseparably, and is of the utmost purity.

WHITE AND COLORED INLAYS AND ENAMELS of almost indestructible hardness and beautiful polish may be made on wood or metals with oxychloride of zinc. The oxide of zinc, very pure and dense, is made into a stiff paste with water (if pigments are used, they are introduced into the dry oxide in powder), and introduced into the hollows to be inlaid, where it is allowed to dry. It is then carefully painted over with a strong solution of chloride of zinc, and the two compounds unite chemically, forming a very hard and dense substance. Before it sets, it may be polished with a piece of smooth, hard wood. If the object is such that the application can be performed very quickly, the oxide and chloride may be first mixed and introduced at once. It is an advantage to have all the materials warm.

THE new pulley belt for the Roger Williams Flour Mills is 134 feet long and 4 wide, and is made of whole hides cemented together, without lacing, pegs or rivets.

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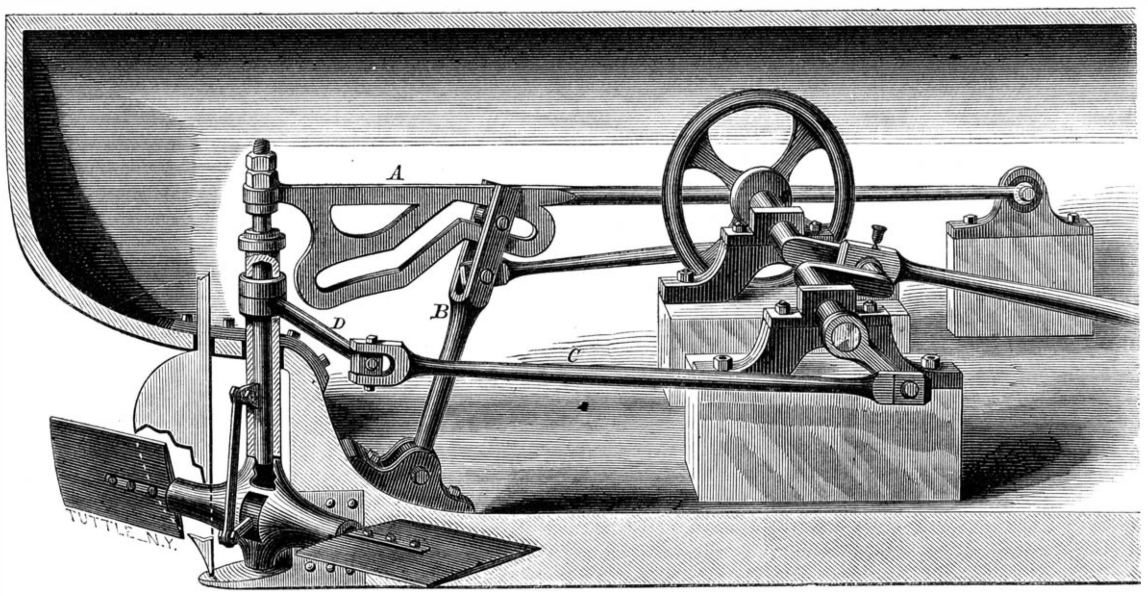
New Method of Propelling Vessels.

The ordinary propeller and the paddle wheel have had many rivals to their work as a means of propelling ships. The turbine wheel and other methods of propulsion by jets of water have been tried with a greater or less degree of success. This plan herewith presented, differs materially from most, although a somewhat similar but crude attempt was made in the early days of steam navigation. Instead of a revolving propeller there are two blades working by a reciprocating motion at the stern of the ship. In the engraving the proportions of the machinery as intended to be employed are not entirely correct, as the design was made from an imperfect model. The principle and its application are however sufficiently explained. An upright shaft at the vessel's stern has two horizontal bearings under water in which turns a shaft having at each end a wide propelling blade. The upright is hollow and inside is a shaft which can slide up or down, by which the horizontal paddle shaft can be turned one fourth of a revolution. This is effected by a connection between the upright sliding shaft and an arm on the horizontal paddle shaft, and the motion is given by means of the cam frame, A, and rocking bar, B, which is driven by a crank or eccentric on the main shaft of the engine. Each end of this cam frame has a slot struck on a radius, of which the pivot of the rocking bar is the center, so that on those portions of the cam-slot the motion of the bar does not raise nor lower the upright sliding shaft which turns the propeller blades. During this period of rest a motion is given the blades in a horizontal plane describing a segment of a circle. This motion is received from the crank on the main shaft through the medium of the bar, C, and arm, D. Back of the step on which the upright shaft turns is seated the lower end of the rudder, which thus works between the propeller blades.



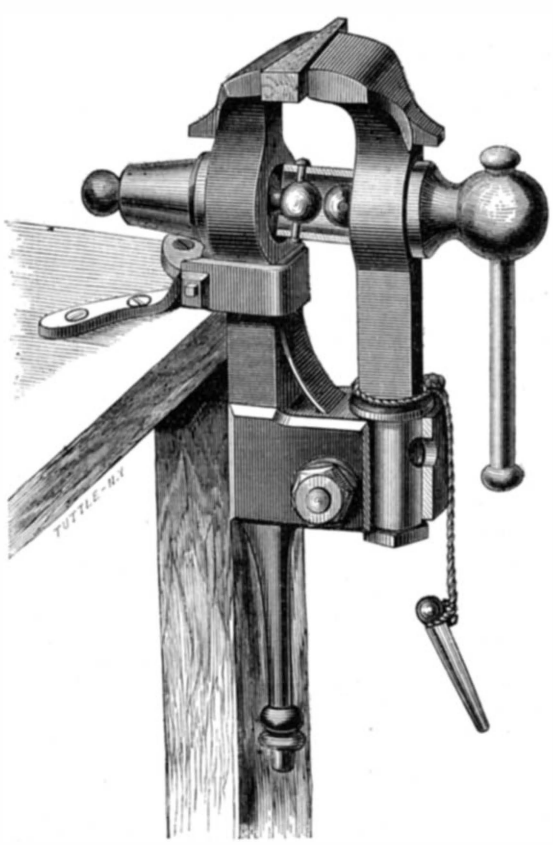
WAIT'S RECIPROCATING PROPELLER.

The operation of the device is as follows: The blades are thrown alternately against the water by the crank of the engine, only one blade acting at a time, the other being "feathered." The two motions of the blades, both a portion of a revolution, one in a vertical and the other in a horizontal plane, are produced by very simple mechanism, and the result as tested by working models is very satisfactory.

It was patented through the Scientific American Patent Agency, Feb. 19, 1867, by Samuel B. Wait of Mariner's Harbor, Staten Island, N. Y. who will answer all inquiries relative to the invention.

GIBSON'S IMPROVED BENCH VISE.

Machinists and other workmen who use the vise in their business not unfrequently are much annoyed by the difficulty



of properly holding and retaining in the vise jaws wedged shaped pieces of work or other irregular forms. The jaws of the ordinary vise are parallel without any device for changing their relative positions. The invention, shown partly in section in the engraving, is an attempt to remedy this defect. It is readily understood both in construction and operation.

The outer jaw instead of being pivoted to the frame of the vise to swing in only one direction, has its lower end formed into a journal by which it may be turned in a box, which is pivoted by a bolt as is the foot of the outer jaw of the common vise. By this means the outer jaw can be placed at an angle, greater or less as may be desired, to the inner or fixed jaw. In order that the screw may be worked when the jaws are in this position, it is made in parts; one end of the screw being formed into a ball and the inner end of the lever knob having a similar ball, both of which are contained in a sleeve or socket and pinned through it at right angles one to the other. This makes what is known as a "universal joint" by which the screw may be operated in any position to hold firmly any object which may be placed between the jaws.

When it is desired to use the vise with the jaws parallel, a tapering pin connected to the vise is passed through the box in which the lower part of the movable jaw turns and through the journal of the jaw, making this portion of the vise as rigid as the ordinary vise.

Letters patent were procured May 14, 1867 by Charles R. Gibson, Madison, Ind., through the Scientific American Patent Agency, who will furnish all further particulars desired by interested parties.

The Early History of Silk Throwing.

Previous to the year 1718, the whole of the silk used in England was imported "thrown," or formed into various threads and twists, from Italy, where it was made by a secret process. About the year 1715, Sir Thomas Lombe, an Alderman of the City of London, dispatched his brother John to Italy to find out, by fair means or foul, the secret of the manufacture. John was furnished with ample means by his brother Thomas, and by a judicious use of the "oil of palms" and the adoption of various disguises, he succeeded in gaining admission to some silk mills in Piedmont. While acting the part of a careless observer or of a workman, he found opportunities of making sketches and even models of the machinery, together with notes of the process, and of becoming a skilled silk throwster. His real character was, however, ascertained, and he was obliged to fly to avoid assassination. Two Italian workmen accompanied him; and with their help, and the assistance of his models and notes, he commenced to make the machinery. He chose Derby as the scene of his operations, and having arranged with the corporation for an island on the river, he erected a mill, probably with his brother's money, at a cost of £30,000. The building is still in existence, and is known as the "old Silk Mill." In 1718, a patent was granted to his brother Thomas for the machinery; and the specification of this patent has just been brought to light after having been "lost" for more than fifty years.

The evidence before Parliament, on a petition for an extension, showed that the price of organzine had been reduced by 25 per cent in consequence of the introduction of Lombe's machinery, and also that the English had been enabled to compete with the Italians in their own country. The petitioner put in a copy of an Italian statute which made it death "to discover anything relating to the making the engines, or working the said organzine silk." The patent was not long prolonged, certain honorable members fearing lest a precedent should be established, but the inventor was rewarded by a grant of £14,000. Such is the history of probably the first attempt to obtain the renewal of a patent.

To return, however, to the unfortunate brother. The Italians were furious at the loss of their monopoly; and a woman was sent to Derby with orders to gain the two Italian workmen in Lombe's employ, and to compass the destruction of their master. According to Hutton a slow poison was administered, and Lombe died after two or three years of great agony, about the year 1724 or 1725.—*Mechanics' Magazine.*

HASTY PUDDING.—It does not appear to be commonly understood, and not even by Webster, that the above title has any other significance than the readiness with which the simple dish coarsely called "mush" is prepared. It has its origin in the vernacular of England, where the word "hasting" is used in the sense of stirring or agitating a liquid mass. As "hasty pudding" cannot be made with haste, unless it is to be eaten raw, but does require a good deal of hasting or stirring, the latter is probably the meaning of the name.

English vs. American Locomotives.

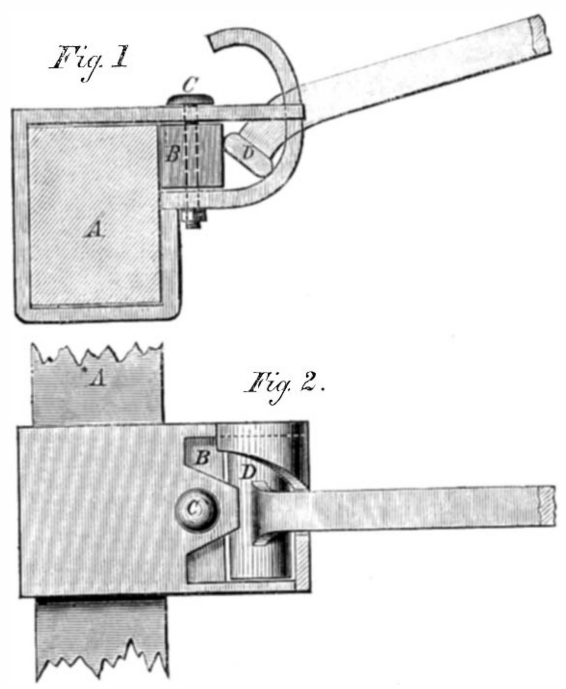
A practical mechanic of considerable experience in English shops, now employed in one of the leading locomotive works of this country furnishes us his observations on the relative merits of locomotive engines in the two countries. He first remarks on the greater nicety of the foreign finished work. Great care for example, is there taken that all double eyes shall fit exactly, not to be tight but so as to fit well and work easily. Bolts, such as are used for the eccentric rod, double eyes, etc., are held in place by washers ¾ or ⅝ thick with steel taper split pins, behind or running through bolt and washer, a plan as cheap and much safer he believes, than the one employed in some of our shops, of having simply a nut with no check to its coming off. It was formerly the custom in England, as it still is in this country, to put steel bushes into the holes of finished work, but the practice is now entirely discarded there, steel being welded on instead. In our locomotive works the connecting rod straps are too light for the key ways, a weakness which the English avoid by raising the strap around the key way, so that there is the same amount of metal there as elsewhere in the straps.

On the other hand the American locomotives surpass the English in many particulars. Take crank pins for example: in England they are turned taper and ground into their places very exactly, the holes being heated red, the pins shrunk in and riveted at the back; still they frequently become loose, while in this country they are turned parallel and forced in, sometimes not even riveted, yet they seldom fail to work well. English engines cannot run with such light finished work as they do here. In regard to the wheels: Stephenson's old engines with outside cylinders, have wrought iron spokes and cast iron hubs of a massive description, yet all cast iron wheel bosses are found to split so badly that it is customary to contract two wrought iron hoops around them, and as they are, with all these precautions, still liable to break, solid wrought iron wheels are in consequence the rule in England. The use of cast iron wheels is regarded by our correspondent as a great advantage enjoyed by us, and for it we are indebted to the superior qualities of our American iron.

We think our correspondent in error in regard to the use of split pins and check nuts. These or some equivalent device are extensively employed in our best shops. The practice of raising the metal around the key and gib slots on straps is quite common in this country. Tapering shank crank pins would hardly recommend themselves to intelligent American mechanics.

HERSEE'S IMPROVED THILL CLIP FOR VEHICLES.

The intention of this improvement is to furnish a ready means of attaching and detaching the thills or shafts from vehicles and of holding them in position while in use, without rattling and wear. The clip is of wrought or cast iron, forged or cast to fit the axle, A. The front portion of the clip curves outward, upward, and backward, forming a recess between its front and the block, B, which is of India rubber



and held in position by a bolt, C. The curved forward portion of the clip is cut away on one side for convenience of attaching and detaching as seen in Fig. 2. The thill iron is furnished at the end with a transverse piece, flattened in its cross section, seen at, D. When the forward end of the thill is depressed the transverse piece may be readily lifted from the clip, but when the thill is in position, as when attached to the horse, one edge of the transverse engages with the inside front of the clip and the other with the elastic rubber, as

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seen in Fig. 1. This prevents all play and consequent wear, rendering the motion of the vehicle, so far as the thills are concerned, quite noiseless. It will be noticed in Fig. 2 that when the thill is in place one of the edges of the transverse piece on the end is under the projecting lip over the rubber block, and the thill is thus prevented from being casually or accidentally lifted from its place. With this device the thills can be removed from the carriage and a pole substituted in a moment to adapt the carriage for a span instead of one horse. By the readiness with which the removal of shafts or pole can be effected, the carriage takes up less room in a stable and they may be kept out of danger of breaking by being stepped upon or driven over.

A patent was issued through the Scientific American Patent Agency, for this improvement, May 21, 1867, to Thompson Hersee, Jr., 307 Main street, Buffalo, N. Y., who may be addressed for further particulars.

Science Familiarly Illustrated.

Insects.

All insects have six legs, unless they have met with accidents. They do not breathe through their mouths, but by means of a great number of little pipes which run through them lengthwise, having openings here and there on the sides of the body where the fresh air is drawn in. These little openings are very curiously contrived—in some cases protected by tiny trap-doors opening on hinges, in others having a strong grating over them of very coarse hairs. Hence, an insect when cut in two, as he does not use his mouth for breathing, and as his brain is not confined to his head but runs all through his body, will live for many hours in this mutilated state. In fact some insects never eat a mouthful after they are full grown.

Insects have from two to five eyes. Two large eyes called compound eyes, because they are made up of many little eyes united, like a bundle of six sided spy-glasses tied together, large at one end and very small at the other, and looking under the microscope, like the meshes of a very fine net. Then there are sometimes three little eyes in addition to the large ones, placed generally on the top of the head, although they occasionally vary their position.

All insects are provided with *antennæ*, which are those little, many-jointed projections extending from the head near the eyes somewhatlike reindeer's horns. These are probably used for feeling, smelling, and hearing with, although their uses have not been definitely settled. They vary much in appearance; sometimes resembling Indian clubs, sometimes fringed like a fir tree, notched like a saw, plumed like a feather, or armed with teeth like a comb. A few insects have no wings, others have two, others four, but none have more than that number.

Insects pass through several stages of existence before they become fully developed. Most of them are hatched from eggs; then they pass into the larva state, in which ther are caterpillar, maggot, or grub, according as they are to become butterfly or beetle. In course of time they go into pupa, or mummy state, from which they emerge ready for action as perfect insects. In some classes these destinctions are not so trongly marked.

On examining a fly with a microscope, you will find six legs, armed each with two sharp little toes; two big compound eyes covering nearly the whole of the head, and the three little eyes arranged in a triangle; two transparent wings strengthened by a net-work of veins, and covered with fine hairs to protect them from wear and tear; a pair of tiny winglets, and on each side of the body a little knob which serves for unknown purposes. On closer examination of his mouth you will find a proboscis or trunk, like an elephant's; this in nothing but the lower lip lengthened and armed with three lancets, with which it punctures its food, or exasperates bald-headed old gentlemen. The end of the lip is flattened and grooved like the bottom of a meat dish for gravy. He is provided with a fluid which running down little canals in his trunk, dissolves soluble substances, so that they are easily sucked up through the same little canals.

On examining the foot closely under the microscope you will see that it is armed with two little claws, protected by fleshy pads, covered with hairs. Each hair is enlarged at the end, making a little disk, which is kept moist by a fluid continually exuding. The little claws catch on the rough point of any surface, and the moment this is done, the little disks take hold by their edges, while their centers are retracted, leaving a vacuum, and thus creating an atmospheric pressure which sustains the insect against the force of gravitation While one foot is raised, the others retain their hold, and the rapid movement of the six legs along a ceiling, shows how swift is the instinctive action of this complex apparatus.

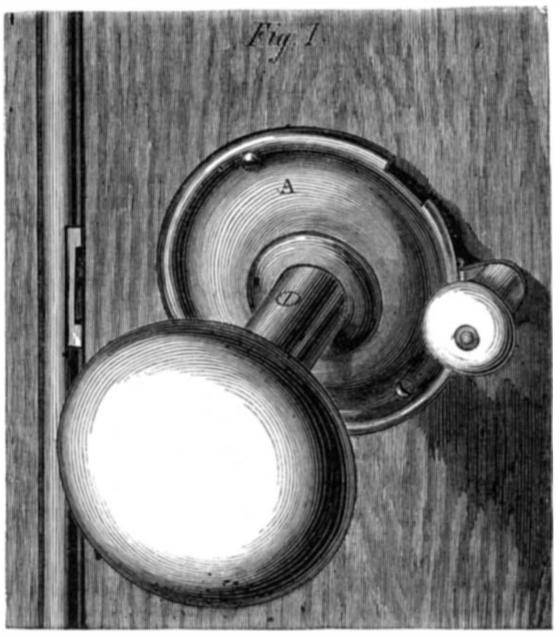
According to Kirby and Spence, the common house fly, when undisturbed, makes six hundred strokes with its wing in a second, and when necessary can increase its velocity sixfold.

There is one fact in the natural history of flies that is generally very little understood, and what is true of flies, is eqnally true with regard to all insects. It is that flies hatched into the winged state never grow any more, either smaller or larger. If he is hatched a small fly, small he remains all the days of his life. His growing and most of his eating, has been done in the larva or maggot state. Then he leads the life of a glutton, eating with apparent relish all most loathsome things, reveling in all sorts of impursties, waxing very fat and aldermanic, as do most large eaters in the human tribe. An old writer well observes, "How few of us are aware that all these creatures now buzzing above our heads once crawled beneath our feet!"—*Riverside Magazine.*

RICHARDSON'S PATENT LATCH FASTENER.

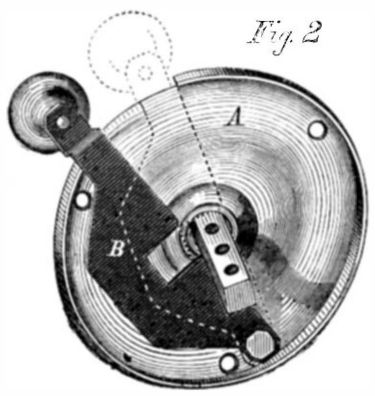
The subjoined engravings represent an improvement in mortise stop latches or locks, for which Letters Patent were issued to F. A. Richardson, of Poultney, Vt., Oct. 23, 1866.

The hardware trade has long felt the want of a mortise stop latch, something which should be simple, and at the same time effectual. More properly speaking it is a patent rose. When applied to a mortise latch, it renders it a perfect lock; for no person from the outside can possibly open the door. It will also be seen to be free from troubles hererofore existing in previous devices for fastening doors, inasmuch as it cannot in any case fasten itself, is perfectly simple, costs much less than the ordinary mortise latch and lock, and is free from the objections to the same for sleeping apartments.



The following are some of its advantages: 1. Its cost, as before stated. is much less than ordinary fastenings; 2. Its simplicity renders it less liable to get out of order; 3. It cannot be easily picked; 4. There is no key to be lost; 5. It is easy of adjustment and an ornament to a door; 6. It can be applied to any mortise latch or lock already on doors with very little expense.

The operation is as follows: Fig. 1 represents the inside of a door and casing, attached to which is a common mortise knob latch. Figs. 1 and 2, A, is a metal rose or washer of the usual construction, only made a little deeper in order to receive the stop, B, Fig. 2, which is made of steel, and fastened to the rose at one end by a rivet in a manner to allow it to move freely. The stop is bent slightly toward the rose before it is riveted on in order to keep it pressed up against the rose so that it will remain fastened when pushed up in place into



the upper notch. It is also bent up or necked at the end, Fig. 2, to prevent its touching the door when moved up or down, thereby not marring the paint or door. The stop has a recess or notch in it, as shown in Fig. 2, to receive and hold firmly from turning the knob shaft. On the necked end of the stop is a small knob, either porcelain or mineral, to correspond with the door knob. It is by this small knob that the stop is worked. The rim of the rose has two notches to hold the stop in its place when pushed up or down. It will be seen by Fig. 2 that by pushing up on the small knob the knob shaft is kept from turning.

For other information in regard to this invention, for specimens, for agencies, and for supplies, address Richardson & Holbrook, at Poultney, Vt., or at 73 Cornhill, Boston, Mass.

Treatment of Magnetic Iron Ore.

The smelting of this important ore, which is found in large quantities in many of the Southern and Western States, has not been carried on with sufficient energy, on account of the great expense in labor and fuel connected with the process. At present it is for these reasons impossible to manufacture iron in any of the Southern and Western States that are too far distant from the coal regions. In a recent interview with Mr. A. Thoma, who for a considerable time was a superintendent of iron works in Russia, Germany, and Asia, he described a process invented by him by which the iron can be produced with but little trouble and with a saving of from 50 to 75 per cent of labor and fuel. The invention, if it proves to fulfill what it promises, will be of the greatest advantage to all iron manufacturers in the United States, and parties interested in the business would do well to convince themselves of its merits.

The inventor, Mr. A. Thoma, is desirous of finding somebody to take an interest in the matter. and to aid him in bringing it into general use. He can be addressed at No. 85 Sixth street, New York City.

MACHINERY FOR CUTTING STONE AND TUNNELING.

While in nearly every branch of industry that man s hand has found to do, his ingenuity has devised important mechanical aids, no machinery, excepting of the most primitive character, has ever been employed in the cutting and working of stone for ornamental or building purposes, and to this cause alone, rather than its original cost at the quarry, or even the expense of transporting to market, is due its great value as a building material. An English exchange describes an invention lately introduced for cutting rock and working up stone so economically, that it anticipates in time a decided decline in the fabulous value now attached to brown stone or marble fronts.

This machinery may be variously applied, as for sawing blocks and slabs of considerable thickness; for facing the surface of squared-up stone in an ornamental manner; for tunneling and undercutting stone, coal or slate *in situ;* also, for the vertical cutting of the living rock almost as readily as a hay cutter cuts hay out of a stack. The main efficiency of the machine depends on the peculiar forms of the cutting tools or movable teeth. These are attached to holders, which are themselves fixed either in the edges of the blade, an improvement on the plan of making the blade serve as a cutting edge; or are applied to the circumference of cylinders, when used for surfacing. In consequence of being movable in their sockets, these tools are easily replaced as required, without any reduction in the diameter of the blade, a fault which so soon renders the circular saw when applied to the cutting of stone or slate, useless.

In working up stone in the rough, the slate or massive block is clamped to a table which, moving on friction pulleys, is fed forward by a self-acting screw, advancing upon the cutting blades at a speed of from three to six inches per minute. The cutting blades, from one to four in number, are fixed to collars which traverse at an angle above the table, supported by uprights and moved by a train of wheels in the usual manner. For cutting window sills, door posts, steps, coping stones and a host of other building materials out of rough blocks of slate—which formerly were thrown away as useless because no means for working them was known—four blades of four feet diameter are employed, and blocks fourteen inches thick, weighing several tuns, are simultaneously reduced to five thick slices, and are immediately split into the thickness required for planing or tooling, as most suitable.

For giving a finished surface to building or other stone of an ornamental character, where breadth not depth is to be cut, the axle itself, or a removable cylinder bolted to the axle, receives the tools which are placed spirally around it, so that a divided and regular pressure may come upon the face of the stone at intervals of two or three inches. Fluting, waving or running figures are produced at pleasure by having the table carrying the stone travel on rails or grooves correspondingly curved. A roughing tool imitates the marks of a pickax in rustic stonework, with the usually chiseled work around it. Some patterns of flat tooling by these machines can be made to imitate chisel work so closely as only to be distinguishable by the finer finish given by the machine.

For quarrying stone a new principle is claimed to have been introduced in this machine. The cutting tools, instead of being placed in a single row around the rim of a thin blade, are fixed in rows of twos and threes alternately across the margin ofa wheel-like disk, so as to clear away a wider space. The outer portion of this disk is a ring of cast iron armed on the outside with tools and carrying an ordinary cog wheel within; a pinion meshes into that part of the inner cog wheel that is continually furthest from the rock. This cogged wheel has as its axis a broad metal plate of great strength and forming four-fifths of the diameter of the entire cutter. In a circular saw with a central axis, the blade can only penetrate to so much of its semi-diameter as is clear of the axle and collar. But this arrangement allows the cutter wheel to be buried in the cut up to the point at which it is held, and practically a cutter three feet four inches in diameter enters the rock to the depth of two feet three inches. Parallel cuts having been made, the rock between is got out by blasting, or if there is any cleavage or layering, it may be wedged up from below.

These machines are extensively used in Wales, and in England a gigantic one, having two blades of thirteen feet diameter each, has been put up at South Shields, by the Commissioners of the Tyne Navigation, for cutting the limestone of the vicinity for the harbor works, and the success attending their working so far induces the belief that a really valuable acqulsition has been made in these machines.

CURRENT RECIPES.

MODELING CLAY moistened with glycerine, is recommended for all the qualities of wax except expensiveness and susceptibility to changes of temperature. The clay must first be perfectly dried.

CLEANSING CASKS BY FIRE, is a cheap, short and effectual mode much in use in some parts of the world. Rancid pork, lard and butter casks, may be purified by burning straw or shavings in them.

DULL BLACK ON BRASS is obtained by rubbing the surface first with tripoli and then washing it with a solution of one part neutral nitrate of tin with two parts chloride of gold. After ten minutes wipe it off with a wet cloth.

TO WASH CALICO WITHOUT FADING.—Infuse three gills of salt in four quarts of water; put the calico in while hot, and leave it till cold, and in this way the colors are rendered permanent, and will not fade by subsequent washing.

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Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

River Embankments---The Mississippi Levees.

MESSRS. EDITORS.—My attention has been attracted by a recent article in your paper on the subject of levees on the Mississippi river. You very justly remark, that these are works of a national character, claiming the aid of the general government, both on account of their magnitude and the importance of uniformity of plans of construction, and the adoption of a system of superintendence that will ensure the greatest care and vigilence in protecting works of such extent, upon the entire preservation of which, depend interests in which our whole country is more or less concerned. We are all affected by the rise or fall in the price of cotton and sugar—so we are, by the cost of wheat, beef, and corn, but these latter, can be produced in nearly every section of our country—sugar and cotton can only be raised profitably in the genial climate of the South; hence those fertile regions in some sense may be regarded as the common inheritance of the nation and especially demanding its care and protection.

But my principal object in calling your attention again to this matter, was to make a suggestion in regard to the better mode of constructing these levees. Having been engaged for many years in the construction of dams, reservoirs and canal embankments, I can speak with confidence in regard to structures intended to resist the action of water. Mr. G. W. R. Bayley's plan, which I have noticed, embraces many good features, but upon the whole, it appears to me objectionable. Mr. B. seems not to have made an estimate of the probable cost of his plan, and therefore I think his impressions are very far below the mark. It would certainly be very expensive; but he justly remarks that "security and safety, should be the measure of economy." I have had much experience with structures composed largely of timber and plank, exposed to the weather, and therefore to rapid decay, and I do not think they are either secure or economical. In my judgement plans should be adopted, not too expensive, involving the use of as little perishable material as possible.

If I had a contract for constructing the levees of the Mississippi now, and maintaining them for twenty-five, or fifty years, I would make embankments ten feet wide on top, with slopes on both sides, of two feet base to one foot rise, and in hight five or six feet above the highest floods. Before commencing the embankment, for a space of ten feet in width under the center of the bank, about one foot in depth of the porous soil should be stripped off and deposited in the slope. Then a ditch four feet wide and three feet deep, should be cut in the center extending the whole length of the embankment. In the center of this ditch, I would set up endwise, close together, two inch planks of sufficient length to reach one foot above high water, securing their edges evenly together by nailing on battens.

The embankment may then be carefully made, keeping the more open and porous material in the slopes. The plank thus posited, would effectually stop leaks from muskrats and crawfish, and being entirely covered up and excluded from the air, would last very many years. The outer slope should be protected with stone, where they can be had at reasonable cost, but generally willows, or any shrub of southern growth, which roots well, may be used with great advantage.

Terre Haute, Ind. W. J. B.

Trades Unions.

MESSRS. EDITORS:—Allow me to say a few words in your journal on this subject, for I am confident, that from personal knowledge, I can show the working of these "unions" in a clearer light than mere theorists. The arguments I advance are supported by indisputable facts. I am an English mechanic, and belong to no trades protection society, not believing in them or their principles. But let me add, under existing circumstances, I do not utterly condemn them, although I have had every provocation from them in my native land. Fortunately trades unions are not yet very numerous in America, and if employers and workmen are wise they will never be.

The main object of a trades union is to protect the interests of the workmen by keeping up their rate of pay, reducing the hours of labor, and, in short, getting every possible advantage out of the employers, while forcing them to pay as much to an inferior as to a good workman. This statement is proved by referring to the late engineer's strike on the London and Brighton railway, where the dispute was narrowed down to a demand by the men that all engineers of so many years standing should be paid an equal rate per day. Now in all cases, the demand for an article determines its value, and it is as unfair for the artisans to combine to raise the value of their labor as it would be in the employers to join to depress wages, or the storekeepers to club together to raise the price of provisions above their natural value. Besides, such combinations tend, if successful, to limit trade, because increasing the cost of an article decreases its use, as persons cannot afford to buy it. Trade societies make another great error in opposing piece work, which, I contend, is the only true way of paying a workman fairly for the amount of labor he performs. It is simply absurd to pay a man for the amount of time he spends in the works instead of for the work he performs, and it is a curious fact that the time system only applies to labor performed. If a butcher was to send in his bill for one hour for delivering a leg of mutton, he would naturally be laughed at. It is altogether a wrong idea to pay for time; pay rather for the amount of work delivered. Now suppose two workmen enter a shop, and one getting piece-work earns say double pay; the other does as much work, but not doing piece-work, only receives day-pay. This is unjust, as it does not give the skillful workman a chance. The course pursued in many large shops in England is, in many respects very fair to the skillful workman; it is this: the bosses go to the best workmen of the establishment and ask them to tender for the work per piece; the lowest tender is accepted. When finished, the work is taken to pieces, examined, and if well done, passed. If not satisfactory the boss stops part payment, and has to be done over again.

The only evil of this system I found to be this, employers do not make sufficient allowance for the difference in skill.

It was in an establishment managed in this way that I became acquainted with the beauties of the trades union system, and personal experience and observation convinced me of the despotic antipathy they exercised toward the skilled laborer, and I am fully convinced that the whole system is manifestly unfair, and so long as it is pursued I can scarcely be surprised at trades unions resisting piece work. J. R.

Paterson, N. J.

The Uses of Aluminium.

MESSRS. EDITORS:—Our knowledge of the highly valuable properties of the new metal Aluminium will soon lead, I trust, to its more facile production when its vast superiority over iron and steel will be fully developed and be made especially manifest in shipping and heavy artillery.

Its toughness, lightness, and incorrodible qualities eminently fit it, either pure or alloyed with other metals, for naval and military purposes. Small arms will bear the highest charges of powder without injury, and they are scarcely heavier than wood, and the cuirass of a few ounces in weight resists a pistol ball at short range. Beds of axles moving at high velocities for weeks continuously show no evidences of wear, and sheets of iron when coated with it, like tin, present a smooth surface in no way affected even by strong acid, and which for the sheathing of ships must prove more valuable than copper, and may perhaps be efficacious in the prevention of fouling.

When the metal can be produced in quantity by economical processes (which I have no doubt will ere very long be accomplished through the aids of chemistry and electricity), the largest guns will be turned out, weighing little more than our six-pounders; indeed, if an interior tubing could now be fixed of some inches in thickness, our largest guns might be considerably reduced in size and weight; and since the light cuirass proves its powers of resisting a ball, a vessel armored with far less thickess of metal might prove perfectly protected, while the weight would scarcely exceed that of teak, and if its specific gravity is correctly given, three or four large guns would not weigh more than one of our iron or steel monsters.

French and English metallurgists speak confidently of its value for all these purposes and many others, and I am most sanguine that our inexhaustible stores of aluminious earths will ere long be turned to good account by the company in course of formation in America. A fine field is open to skill and energy. Our muffs at the Admiralty will not stir a finger in such matters, though their noses always point westward when subjects of this kind are brought before them. This I know, and I address myself to you, hoping if you find my statements correct you will give the subject the aid of your powerful pen and cast it on the waters for fructification.

THOMAS INGLE.

The Villetta, Ensworth, Hauts, England.

Street Pavements.

MESSRS. EDITORS:—Your important suggestions to theoretical inventors of street pavements are particularly valuable to future aspirants in that line, for we need and must have a good and comparatively inexpensive and lasting street pavement, and this will bring out an unusual crop of inventors until the object is obtained.

Although asphaltum compounds have stood the test for thousands of years without detriment, [see mummies, courts, etc., in Egypt and other places], and in combination with sand, gravel, etc., in modern times, as street pavements, docks, parade grounds and walks, with perfect success under the attrition of immense traffic for thirty-five years, as in Paris, and for seventeen years at the Horse Guards in London, without disintegration; yet in more modern times they have been failures, such as the blocks in Memphis, Tenn., Regent and Oxford streets, London, yards of Cincinnati, gas-works, Ohio, Rue de Paix, France, and yet the projectors of them say the ingredients and proportions are the same as the older ones of France and England. Why do modern asphaltum compounds disintegrate and crumble? I will give your readers my experience—dearly paid for—so that others may profit by my failures.

In 1847, on my return from France and England (during my stay I examined the pavements, etc, in Paris and London, and brought specimens of them to analyze) I experimented practically by subjecting my compound pets to the action of a crowded street, for several years; I recorded all my attempts, very minutely—date, ingredients, variations of temperature, time under treatment, etc., and after eleven years of experiments with what appeared success in every instance, up to a certain period, there were ten complete failures. When the tests were continued for three and four years they would, previous to that length of time, disintegrate; but for several months, some for over two years, bade fair to be reliable, good, permanent pavements, and nine of them are, at the end of twelve months, recorded as good. Yet they were all failures but the eleventh; and I found out the cause. It is not in the proportions of asphaltum, sand, etc., but it is due to the degree of heat at time of incorporation. A few blocks marked No. 3, composed precisely the same as Nos. 1 and 2, were laid down in front of Mark & Co.'s ice depot, Cincinnati, Ohio, in 1857; in 1859 they were taken up, and placed in the office of the *Scientific Artizan*; in 1860 they were put down at the railroad depot, West Point, Ga., and in 1861 they were as good as when first put down in 1857. The others, Nos. 1 and 2, placed alongside, made from the same ingredients and in the same proportions; but without any regard to degree of heat, crumbled away in 1859. The evidence is conclusive that all asphaltum pavements must be carefully managed as regards a certain degree of heat; and I have no doubt, if I had not been financially ruined by the war, many of our cities would be now paved with beautiful noiseless asphaltum pavement, without dust, and in a sanitary point of view, pre-eminent on account of its solidity and entire freedom from cracks and holes,

ALBANY PACKHAM.

Carrollton, Ky.

A Suggestion for Managers of Agricultural Fairs.

MESSRS. EDITORS:—We are now approaching the season when cattle fairs, strawberry festivals and other gatherings of a similar nature are in fashion. It has been the custom in the award of prizes at these exhibitions to consider with the greatest favor those farmers who have produced the *biggest* fruit, or cattle, or other product of the field or pasture. It seems to me that this system has not been productive of the best results. The constant tendency of every thing we eat has been upward for some years past, even before the war had operated to raise the price of labor and all materials used in agriculture, and the system I speak of above has tended to still further inflate the market. I have to suggest that a new experiment be tried, of awarding the premiums to him who produces off a given area the *greatest quantity* of fruit or vegetables, the only condition being that the fruit, etc., competing for prizes be all marketable, or good of its kind. I am not a practical fruit grower, but I have been told that this big fruit—strawberries, for instance—is only produced by the sacrifice of many of the smaller blossoms on the plant, and the consequent destruction of nearly as many berries. Does not the same rule hold in the cultivation of apples, pears, etc.? The importance of our having an abundant supply of good fruit and vegetables cannot be over estimated, though Dr. Graham finds few followers at the present day. If then, farmers are urged to compete for prizes to be awarded to the greatest producers, it is fair to presume that a greater quantity will be put on the market, and the fruit consequently at a lower figure; the farmers, I think, would not be the losers in "the long run." The same remarks apply with equal force to the raising of cattle; for though the breeder may not kill off his smaller calves to produce one big yoke of oxen yet these monstrous creatures which one is called upon at our annual cattle shows to admire, are oftentimes only raised by an immense amount of care and expensive labor. Can you not call the attention of the agricultural world in general, and that portion of the public press devoted to the interests of farmers in particular, to this matter, before the directors of the societies in the different sections of the country have promulgated their official lists of awards and premiums?

"CONSTANT READER.

Boston, Mass.

Governor Expansion Cut-offs.

MESSRS. EDITORS:—Having perused your journal of the 11th of last month, my attention was called to a description of the Dickinson Combination Governor and Variable Cut-off, and as I have made the steam engine my practical study for a number of years, I would ask permission through your valuable journal to lightly touch this subject so often commented upon.

Having examined the drawings and specifications of the above governor, I am prepared to say that it is very well adapted for the purpose intended, and is well worthy of the highest approbation. Leaving the rest for the more competent to decide, allow me to state the result of a few trials I have made upon the mode of working steam expansively at our works in Philadelphia, during the past six or eight months. They are thus:—Placing a chest, as usual, containing an alternate induction Nightingale valve, having its face pocketed longitudinally for the transmission of refuse steam, transversely over the center of the cylinder, and arranging it with a double trip motion operating the valve, admitting the steam to the opposite ends of the engine cylinder, in combination with an independent rocker connected with the eccentric in the usual way. The tripping pieces being under the control of a governor, or other suitable means of regulation, whereby the induction of steam is enabled to be effected in a positive manner at the commencement of the stroke of the piston, and the cutting off being thus enabled to be effected at various points of the stroke. This construction works very well, but is, in my estimation, not as efficient as the Nightingale arrangement, as in the latter the cylinder is entirely clear of waste steam in the port.

Another, but more simple mode of obtaining expansion, but only to a moderate effect, is, by attaching permanently to the shaft of the valve a rocker, slotted for the reception of a pin or other suitable means of adjustment, from the extremity of the eccentric rod, the pin being attached to and under the control of a governor, the relative position of the balls increasing or diminishing the leverage on the valve, thus forming a cut-off at different points of the stroke. But this mode is not as perfect as the former, as the movement of the valve is entirely dependent upon the motion of the cam. Where there is steady motion required, it may become necessary to make a few trifling adjustments for the prevention of accidents.

There being so many different minds and notions relative to the practical method of working expansion, I have thus

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far decided to write this article for the SCIENTIFIC. The differences of opinion are vast, some pretending to say, that to work steam expansively requires ten or fifteen per cent. more coal than to follow full stroke. I have tried it, and have found it to be an advantage, and shall continue to promulgate the doctrine until I am convinced to the contrary.

Yours, R. S. D.

Reading, Pa., June, 1867.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

WASHING MACHINE.—Alexander Brooks, Waverly, N. Y.—This invention has for its object to furnish an improved washing machine so constructed and arranged as to wash the clothes rapidly, thoroughly and conveniently and without injury to the fabric.

ADJUSTABLE PARALLEL VISE.—O. V. Flora, Madison, Ind.—This invention has for its object to furnish an improved vise which can be readily and quickly adjusted to the size of the object to be held, and which will adjust itself to the shape of the object to be held whether its sides be parallel or inclined.

CLOTHES DRYER.—Reubin Hamblin, Mishawaka, Ind.—This invention has for its object to furnish an improved apparatus for drying clothes by means of which a large drying surface may be supplied while occupying a small amount of space.

LIFE PRESERVER.—John Golding, New York City.—This invention relates to a device by which matresses can be connected to form floats for the purpose of saving the lives of shipwrecked passengers. The invention consists in the application and attachment to the ends and sides of matresses of snap hooks and eyes or loops whereby a number of matresses can be instantaneously connected into one floating structure, upon which a number of persons can find temporary supports with a sufficient quantity of provisions and other necessities.

BELTING.—C. J. Fay, Philadelphia, Pa.—This invention relates to the use of paper made of manilla, hemp or grass, for the purpose of belting of any description for machinery, etc., and also for harnesses and other similar purposes.

MACHINE FOR FORMING SPOKES.—C. C. Dupue, Wayne, Mich.—This invention has for its object to furnish a cheap and durable machine that can be run with one horse power or by hand, and which will finish a spoke at one operation.

HINGE.—Wm. Webb, Waterbury, Conn.—This hinge is especially designed for coal oil lamps, and is so constructed as to produce a stop or rest for the chimney holder as it is swung away from the wick tube.

LAMPS.—E. D. Norton, Bradford, Pa.—This invention consists in combining with lamps, a safety valve of a novel construction through which the gases formed in the lamp, can escape as fast as generated, and thus all possibility of an explosion be obviated.

MACHINE FOR MEASURING AND LAPPING TAPE AND BRAID.—Wm. Rhodes Arnold, Providence, R. I.—The object of this invention is to measure tape, braid, binding or other similar goods into exact lengths for the trade, say in pieces five yards long, and at the same time form them into sticks by lapping or folding.

CARRIAGES.—Caleb Condemann, Hornellsville, N. Y.—This invention consists in securing or suspending the body of the buggy, to the axles by and through the means of springs applied in a novel manner whereby many advantages are secured.

COMBINATION OF SPRINGS AND HINGE FOR DOORS AND WINDOW BLINDS, ETC.—Alvah Wiswell, New York.—This invention consists in a novel and improved combination of a spring and hinge, as hereinbefore fully shown and described, whereby the spring is rendered subservient in keeping the door or blind in both an open and a closed state so as to render unnecessary the use of fastenings for that purpose, and also rendered capable of closing the door or blind after being partially opened and of being graduated so as to operate with a greater or less degree of strength as may be required,

APPARATUS FOR SUPPLYING AIR TO LIFE BOATS.—P. F. Schenck, Riceville, N. J.—The object of this invention is the saving of human life in case of ship wreck by supplying a life boat or vessel with fresh air for the respiration of passengers contained in the vessel which is otherwise hermetically sealed, while at the same time the sea waters shall be effectually excluded.

MACHINE FOR DRESSING LEATHER.—Charles Korn, Wurtsborough, N. Y.—This invention consists in the arrangement of a clearer and sharpener by which each knife, which is secured to an endless apron, is cleaned and sharpened, after it has served to shave or whiten the skin of leather. The said sharpener and cleaner are combined in one sliding block, and are made self-acting and can be adjusted to knives of different sizes. When a knife has been cleaned and sharpened, the sliding block returns to position to operate the nexknife, and so on, the whole device operating automatically.

CUT-OFF CONNECTION FOR STEAM ENGINES.—T. S. Davis, Jersey City, N. J.—This invention consists in the use of a scroll or inclined plane, actuated by the governor in combination with a bar or rod or its equivalent, arranged to operate in connection with the ordinary link or other valve or cut off motion and in a plane or direction at a right angle or nearly so, to and against the said scroll or inclined plane whereby the governor is given the power or means requisite to overcome and hold steady the link under all circumstances of friction slip of block, etc., as by the connection between the link and scroll or inclined plane, the thrust of such connection is taken up on the faces of the said incline or scroll, consequently preventing all vibration of the balls of the governor, except what is directly due to an increase or decrease in the speed of the engine.

LATHE FOR TURNING AND CUTTING SQUARE AND BEADED WORK.—Frederick Baldwin, Brattleboro, Vt,—This invention consists in the employment or use of rotating cutters in connection with a rotating pattern, a hollow stationary mandrel, and feeding device, the several parts being made to work automatically, whereby a machine is obtained capable of being operated rapidly and at the same time performing its work in the most perfect manner.

BRICK MACHINE.—Jonathan Mills, Des Moines City, Iowa.—This invention relates to the construction and to the general arrangements of the parts of a brick machine whereby many of the objections which have hitherto been met with in the manufacture of brick, are overcome.

METHOD OF CONDENSING FOUL VAPORS.—Samuel Davis, New York City.—This improvement relates to the manner in which the steam and vapor generated in fat boiling and other processes of a similar nature are condensed and rendered harmless.

COMPOUND FOR TEMPERING STEEL TOOLS.—William G. Esser, Milwaukee, Wis.—The object of this invention is to furnish a compound for tempering stone cutters' tools and especially mill picks so that they shall be much more durable than when tempered in the ordinary manner.

WAGON SPRING.—John G. Ostrom and Garret C. Landsing, Rhinebeck, N. Y. Patented June 11, 1867.—The object of this invention is to provide a very simple and cheap but a very elastic spring or rather set of springs for wagons and sleighs, and the invention consists in arranging a series of pairs of flat wooden springs each pair being laid at right angles across the pair above so that the more sets of springs are applied the greater will be the elasticity of the whole.

INSULATOR FOR TELEGRAPH WIRES.—Alfred B. Day, Oak Creek, Wis.—The object of this invention is to provide an insulator for telegraph wires with a dead air chamber by combining a wooden plug, a number of glass lugs and a wooden disk in such a manner with a cast-iron shell that only a very small orifice is left around the pin hook for the atmosphere to enter, and any moisture entering by that orifice will, by reason of the lower temperature of the iron shell condense and settle thereon leaving the wooden plug and the glass lugs very nearly in a dry and non-conducting state.

MACHINE FOR COATING HATS.—J. F. Mathias and D. M. Legat, Paris, France.—This invention relates to a machine for feltering hats in which the hats are fitted upon suitable supports arranged upon a revolving shaft, the material being thrown upon them by means of a fan, the whole being encased in an air-tight box.

CLOTHES BAR.—Hosea Willard, Vergennes, Vt.—This invention relates to a new and improved clothes bar for holding clothes for drying and is an improvement on a device for a similar purpose for which Letters Patent were granted this inventor bearing date Feb. 18, 1862, The original invention has its bars applied to the bracket in such a manner that they can, when not desired for use, be folded upward only, and the within-described invention consists in applying the bars to the brackets in such a manner that they can be folded either upward or downward as desired, and which is an improvement from the fact that in many instances the bars when folded upward are very inconvenient to reach and in that case may be folded or turned downward.

AMALGAMATOR.—R. W. Howard, Warwick, R. I.—This invention relates to a new and improved device for amalgamating gold and silver and it consists of a revolving or rotating pan placed within a stationary or fixed one the former having its exterior provided with spiral flanges and the bottom of the stationary or fixed pan provided with a gutter or trough at its edge whereby the pulp or crushed quartz is kept in contact and thoroughly incorporated with the quicksilver and the latter amalgamated with all the precious metal contained in the former.

ESCAPEMENT FOR TIME PIECES.—Hermann Reinecke, New York City.—This invention relates to mechanism which combines the advantages of the detached escapement with the lever escapement, the balance being so arranged that it receives an impulse from the escape wheel while it swings in one direction only, while it is perfectly free from the power of the mainspring during the other half of its motion and the impulse produced by the escape wheel is transmitted to the balance by means of a lever.

NIPPLE SHIELD.—C. H. Wilder and J. M. Wilder, New York City.—This invention consists in the arrangement of a screen in combination with a nipple shield in such a manner that by said screen the nipple is prevented from being drawn out any further than desirable and the usefulness of the nipple shield is materially improved. The screen is made adjustable so that its position can be regulated to correspond to nipples of different sizes.

DOUBLE SEAMING MACHINE.—John Rupp, New York City.—This invention relates to a machine which serves to attach the bottom to a kettle, pot or other vessel of a cylindrical, conical or other desirable form or shape. Said vessel is placed in a reverse direction on a disk from the center of which rises an adjustable standard intended to support the circular blank of the bottom. The blank is held in a concentric position by the lowest speeds of three or more cone rollers and by the action of the successive shoulders of said cone rollers in combination with suitable burring rollers the operation double seaming is accomplished, the disk which supports the body of the vessel being mounted on a vertical shaft to which a revolving and also a rising and falling motion can be imparted.

BUTTON FASTENING.—Benjamin Moser and David Yellott, Brooklyn, N. Y.—This invention relates to an attachment for buttons, studs, etc., whereby they can be so secured to the clothing as to render it impossible for them to be lost.

MANUFACTURE OF ORNAMENTAL FEATHERS.—Frederick Emil Schmidt Hoboken, N. J.—This invention relates to a new manner of coloring feathers so that the same may be prepared for the market, and be used on ladies' and children's wearing apparel and for other ornamental purposes.

BURGLAR ALARM.—Henry R. Robbins, Baltimore, Md.—Patented June 18, 1867.—This invention consists of two spring piston hammers, so arranged as to be released by the opening of door, which touches the trigger and causes them to explode the caps. The nipple has a projecting point, and the hammer a corresponding depression, to secure explosion. The instrument is attached to the door jamb by penetrating points or by hooks.

COMBINED SEED AND GUANO PLANTER.—Thomas W. White, Milledgeville, Ga.—Patented June 18, 1867.—This invention has for its object the construction of an instrument which may be used either as a common plow or for sowing guano or planting cotton, seed, corn, peas, etc, and which shall be light, simple, cheap, and durable.

COMBINED COTTON PLOW, IRON TURNER PLOW, AND SCRAPER.—T. P. Warren, Norfolk, Va —Patented June 18, 1867 —The object of my invention is the construction of an instrument which, with slight and easily made changes, can be used as a cotton plow, an iron turner plow, or a scraper, at the pleasure of the operator.

BOLT TRIMMER.—Henry Howe, Oneonta, N. Y.—This invention relates to an improvement in bolt trimmers, and consists of two bars of iron or steel, flattened at one end and pivoted together, the lower bar having a hole in its flat end to hold the nut while the cam shaped sharply-beveled flat end of the upper bar is forced over it.

PESSARY.—W. G. Grant, Clyde, Ohio —This invention consists in making a pessary hollow, and of such an internal shape as to fit about and encase the neck to the uterus when placed thereon, and of a conical or tapering shape upon its outside, whereby it can be the more easily inserted or withdrawn according as may be desired, and, when worn, rendered the more comfortable and agreeable in feeling to the person or wearer.

SPECTACLES.—George D. Edmondson, Watkins, N. Y.—Patented June 18 1867.—Each lens consists of two pieces of different magnifying powers, and let in different planes. The line of division between the two is the horizontal mid section, the upper portion is of greater focal distance for viewing more distant objects. The plane of the upper portion is at right angles to that of the bows, and at almost the same angle to the axis of the eyes when adjusted horizontally, the plane of the lower halves is inclined to the former so as to be about at right angles to the axis of the eyes when declined in reading, etc.

BEADSTEAD FASTENING.—Jeremy B. Wardwell, Georgetown, D. C.—Patented June 18, 1867.—This invention consists of the dovetail tenon on the end of the rail, being received within a mortise plate on the post; one side of the mortise rotates to open or close it upon the tenon.

PRINTER'S INK.—Moritzruos Weissberger, St. Paul, Minnesota.—Patented June 18, 1867.—This invention consists in combining the mineral resin found in the neighborhood of Petroleum, Ritchie County, West Virginia, in due proportions with the mineral lubricating oil pumped from wells near Parkersburg, West Va., and with lampblack, forming several varieties of excellent printers' ink.

BRAKES FOR WAGONS AND OTHER VEHICLES.—George S. Zeigenfuss, Doylestown, Pennsylvania.—This invention relates to an improvement in brakes for wagons and other vehicles, and consists in an arrangement for locking the wheels from the top of a load or side or rear of the vehicle, or from two or more of the said positions upon the vehicle together, as may be most convenient, independently of each other.

FURNACES FOR BURNING PYRITES WITHOUT THE AID OF FUEL.—John Hughes, Edgewater, N. Y —This invention relates to a new and improved plan of construction of furnaces or kilns for burning iron or other pyrites to expel the sulphur either for the purpose of utilizing it in the manufacture of sulphuric acid, or for extracting the metals which may be associated with the mineral. The pyrites are burnt in my improved furnace without the aid of fuel to maintain combustion after the fire has been started with coke or other suitable kindling stuff by the ignition of the sulphur alone.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Planing Mill and Sash, Door, and Blind Factory Wanted. Address A. P. Smith, Sterling, Ill.

Jos. Lees, 285 Avenue B, New York City, alleges that he has valuable improvements in manufacturing gas from coal, and he wishes to engage with some company where his services may be appreciated.

Rolling Mill Manager Wanted—Competent persons desiring a situation will address with references Marshall P. Smith, Baltimore, Md.

Wanted—Experienced agents to sell the rights of our Clothes Drier patented Jan. 22, 1867, and illustrated in the SCIENTIFIC AMERICAN of April 13th. 55 per cent will be given to good agents. Address patentees Seeman & Catrow.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

R. L., of Pa.—The magnetic needle is often used with success in searching for iron ore. It should be 5 or 6 inches long and be so suspended that it may be free to dip. The needle, however, is effected only by magnetic ores.

C. S., of Mich.—"With what velocity does steam pass from the boiler to the cylinder, the pipe being 4 inches in diameter and 15 feet long?" The velocity depends upon the amount of steam used by the engine. If the engine takes a pipe full in a minute, the velocity is 15 feet per minute; if a pipe full in 10 seconds, it is 90 feet per minute, etc. The old engineers who propound this question to C. S. are perhaps thereby poking fun at him.

W. G. R., of N. Y.—A copper color is given to small iron castings by well cleaning them in dilute acid, rinsing in water, and dipping in weak solution of sulphate of copper, or tumbling in saw dust moistened with the solution of sulpnate of copper. After the coppering the goods must be well rinsed in water. The film of copper secured in this way is exceedingly thin and will not bear much rubbing.

G. N. T., of N. Y.—The device for hanging yard gates so that they shall close by their gravity is quite common. It may be seen in almost every large village.

G. C. C., of Md.—"Will a current of air forced through hot oil or lard in bulk, reduce the temperature of the oil or lard below that of the air"? No. Singular question!

M. B., of O.—There is great confusion in the United States in the matter of weights and measures. Congress in 1830 revised the subject and authorized a system to be followed at the custom houses and other federal institutions. Many of the States have adopted the national standards, but among the others there is no uniformity. The national gallon is of the capacity of 230 cubic inches, and this is the only gallon which is recognized by the U. S. authorities. Besides this there are in use at least four other measures of different capacities called gallons. The adoption of the metric system is the easy way of escaping from the perplexities of the present systems.

A. B. N., of Mass.—We are not aware that any use is made in practice, of the decomposition of water by electricity It is in fact one of the most expensive methods of obtaining the elements of water.

F. V. R., of N. Y.—You can give india-rubber a coating of gutta-percha, by dissolving the gutta-percha in a volatile solvent like bisulphide of carbon, and applying the solution in the manner of a varnish

P. Y., of Wis.—Your third communication on The Crank Motion is received and with the others placed upon file. We consider the subject has been sufficiently ventilated in these columns and disagree with you in the opinion that your article would be read by many with interest. The whole subject was ventilated in our columns at least ten years ago, and we do not care to reproduce time after time, projects which after the lapse of ten or a dozen years have brought forth no practical results.

W. H. A., of S. C.—The glaze of pottery is a glass which is a little more fusible than the ware. The composition of the glaze and the manner of putting it on should vary with the use to which the ware is to be put. A potter therefore should understand the properties of the ingredients employed in glazes, and should be able to determine the proportions in which he should use them.

R. M., of Pa.—The weight of a bushel of bituminous coal as established by statute in your state is 80 lbs. avoirdupois; of cannel coal 70 lbs.

W. R. S., of Pa.—Ordinary or saturated steam will be condensed to water by any increase of pressure, or diminution of heat. Superheated steam is ordinary steam which has been further heated, and maintains its elastic condition under increased pressure in proportion to the amount of over heating.

D. B. T., of O.—Pressure and temperature have practically no effect on the specific heat of air or water. In solids the increase of specific heat by increase of volume or temperature is quite notable, and it is likely that the same causes will increase the specific heat of air and water, but it is known that the increase is so small that it can never be accurately determined by direct experiment.

T. R, of N. Y.—Ink stains may be removed by applying a weak solution of oxalic acid. Care should be taken to wash out also the excess of acid as it is corrosive to organize matter. . . . The sun happens to be nearer to the earth in winter than in summer, and the reason that we feel less of his heat in winter is, that the rays strike the atmosphere at a smaller angle and are consequently reflected off into space. . . . It is a commendable practice to heat crucibles very gradually. Careful operators will get about twice as much service out of crucibles, as those who put them cold or damp directly into an intense fire.

A. L., of N. Y.—Coal tar pitch (the residuum of coal tar distillation,) is one of the most approved roofing materials. It is most often used in combination with felt or paper. A shingle roof is rendered more durable by painting it with coal tar. The preservative substance of the tar is carbolic acid, which being volatile is not retained in the pitch. But remember that a shingle roof is more combustible when coated with tar.

W. C. G., of Iowa.—The heating power of a battery is proportioned to the size of its plates, while the physiological effect is proportioned to the number of pairs of plates. We would not venture upon advice as to size, construction, and cost of a battery for heating purposes without knowing the details of the use. You wish to heat a strip of platinum. Is the strip exposed to a current of air? Is it to be brought into contact with any liquid or solid substance?

E. B., of Pa., has a wall which is so damp that paper pasted on it will peel off, and wishes to know if silicate of soda will render it water proof. An application of silicate no doubt will improve the wall and especially if it be of limestone, and we advise him to try it. But it cannot be expected that the process will be as thoroughly effectual as the ordinary lath and plaster.

W. B., of Wis.—In melting zinc care should be taken that it does not oxidise by overheating or by too much exposure to the air. It is a good plan to keep the surface of the molten metal covered with fine charcoal or sawdust. You can improve your injured metal by remelting and stirring saw dust into it.

R. A. D., of Wis.—"People out here claim that a raft of lumber will travel faster than the current, and that a raft of logs will go faster than the lumber." People have strange ideas out there.

G. K. S., of N. Y.—Gutta-percha is soluble in benzole and turpentine, and shellac in alcohol, but the two solutions do not mix kindly. A good common solvent of shellac and rubber, or gutta-percha, is still a desideratum.

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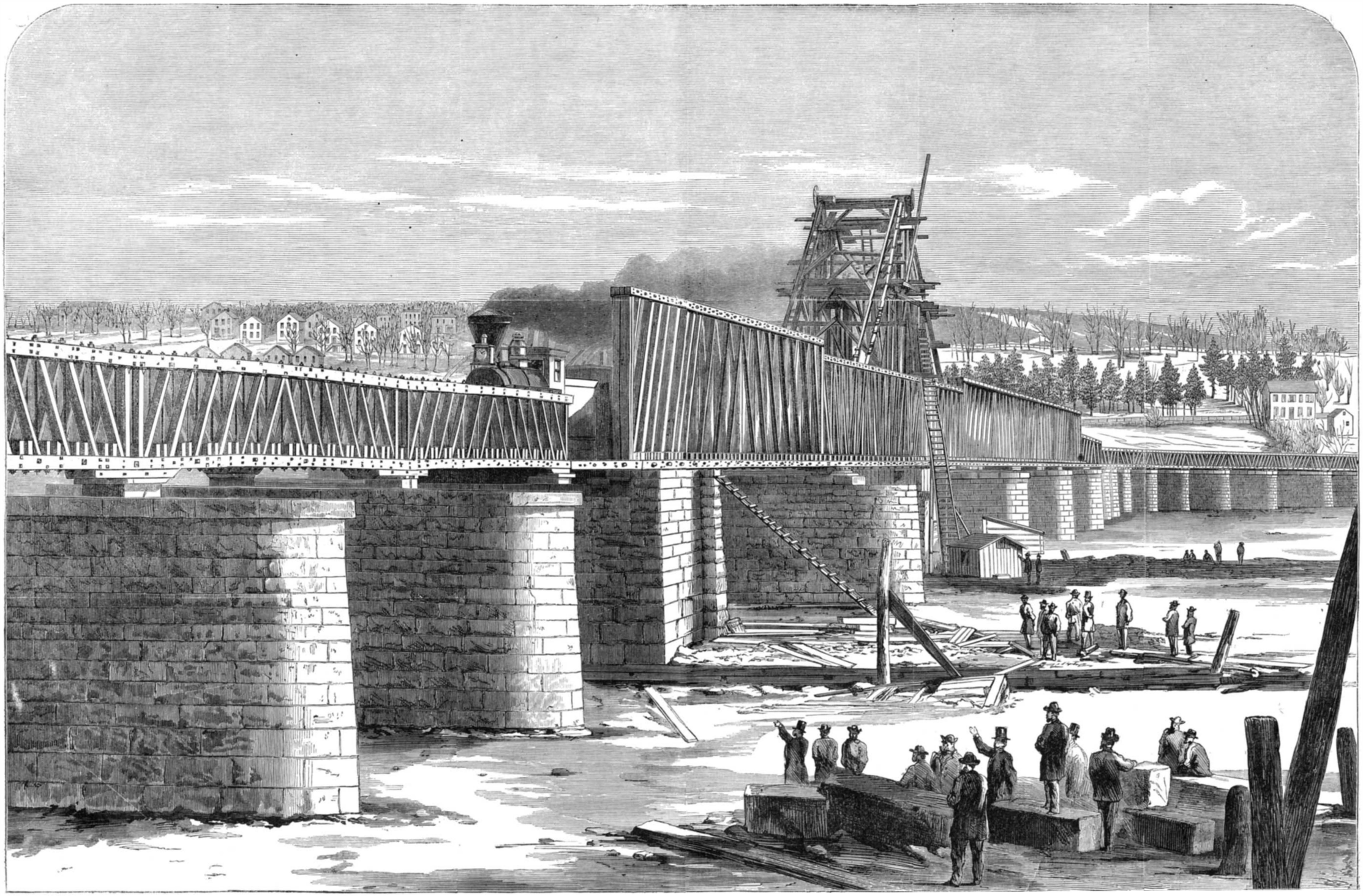

THE GREAT RAILROAD BRIDGE OVER THE HUDSON RIVER AT ALBANY. [SEE NEXT PAGE.]

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MACHINERY IN THEATRICAL REPRESENTATIONS.

The term "machinist" may by some of our mechanical readers be considered as misapplied when used to denote the builder and manager of the contrivances employed behind the scenes of a theater. But very much of mechanical skill is required to produce the effects witnessed by the audience at any of our first-class theaters. Having visited one of the popular theaters in this city known for the excellence of its mechanical effects, we will note some of the appliances employed. The stage, with its appurtenances and the rooms connecting, occupies more of the space included within the walls of the theater than the auditorium. Descending two full stories below the stage and ascending two above, the "behind the scenes" is an immense workshop where mechanics in almost every branch ply their several trades. Without attempting to describe the different departments in detail, we will endeavor to give briefly an idea of the strictly mechanical devices by which effects are produced.

The floor of the stage is made in movable cross sections, of southern pine plank, of sections varying from ten inches to three feet in width and ten to fifteen feet in length, traversing inclined slides secured under the floor. These slides incline from the center of the stage toward the ends, these portions of them being depressed enough to allow the thickness of the planks to slide under the floor. The movements are effected by means of ropes secured to the sections and wound upon strong winches beneath the stage. The slides are lubricated with dry, powdered plumbago, without a particle of oil. When the sections are closed the outer ends are elevated to the level of the rest of the floor by cam levers which hold them securely. Through the openings thus made in the stage the scenes which rise to slow music in the piece are elevated. One of these, the grand "transformation scene," weighs not less than six tuns with its load of humanity. To effect this result immensely strong geared windlasses are employed, turned by a number of men who work in perfect accord. Guiding bars of two-inch iron and lifting apparatus in which five-inch ropes are used, afford perfect security.

This machinery is all situated two stories below the stage, a distance of about thirty feet, to give room for the hight of the scenes. Both day and night this subterranean apartment is lighted by numerous gas jets. All the machinery is of the strongest description; in fact strength rather than elegance has been the rule in its construction. The machines for lowering the scenery from above the top of the proscenium are also located here, iron braces, strong ropes, and heavy timber being the agencies for the transmission of the power. Two heavy double force pumps with two-inch hose are also fixed in this sub-basement, intended either to force water in torrents to any part of the building in case of fire, or to supply the water for a cascade in one of the scenes, or to pump it up from the receiving reservoir to the hight necessary to reach the waste sewer.

The cascade mentioned above is as real as any in nature, except that the rocks are made of zinc, soldered water tight and painted. Other minor cascades are merely rotating cylinders covered with gauze, flecked with mica and having a strong light thrown upon them by rows of gas jets. Gas and lime lights perform no insignificant part in the spectacle. In one scene the light changes from a cadaverous green to a ghastly blue, gorgeous red, and brilliant white. This is effected by changing the lenses of the lime lights, situated in the wings at an elevation of twenty feet from the stage, and aided by cylinders covering rows of gas lights made of the different colored gauzes disposed in longitudinal sections.

The work of the "property man" and "carpenter" with his assistants demands also considerable mechanical skill and talent. For instance, the "crystal columns" in a "ball room" scene are semi-cylindrical and about twenty feet high. They are built of timber and mounted on trucks, the capitals being much heavier and larger than the bases, yet the weight is so distributed that there is no top-heaviness nor danger of overturning in moving. The ornamented capitals are of papier maché, molded in plaster of Paris, which molds must be fashioned by hand, or rather the patterns from which they are made. The angles of the uprights of which the shafts of the columns are built, are so arranged as to reflect the gas lights inside the columns to produce a dazzling effect. This requires mechanical skill and a thorough knowledge of optics and of the effects of light on the surfaces of differing angles.

All the work is of the strongest possible character, to insure against accident, and every part of the ponderous machinery is calculated to move with the greatest ease and in perfect concert with every other part.

THE STEAMER "BRISTOL."

With the exception of her consort, the *Providence*, no such magnificent ship has ever been built for sound or river navigation as the *Bristol*, of the Narragansett Company's line between New York and Boston. On the 11th of June she made her trial trip, and in all respects this, her initial effort, was an entire success, but it is a cause for regret that the original significant names of these two vessels, *Puritan* and *Pilgrim*, should have been changed to *Bristol* and *Providence*, names of merely local significance.

The *Bristol* is a ship of about 3,000 tuns measurement, built in all respects like a first-class sea-going ship, and yet combining all the space, elegance, and airiness of the best sound and river boats. Water-tight compartments, immense rigidity and strength of hull, iron braced and securely bolted, strengthened by hog braces, make this ship one of the staunchest that ever floated. The solidity, beauty, and luxury of her internal fittings, upholstery, furniture, and arrangements are beyond dispute unequaled.

But the machinery is eminently superior. Her single beam engine of 110 inches diameter and 12 feet stroke, the largest, with the exception of that of the *Providence*, ever run on a ship, is a model of fine workmanship and easy manipulation. It is furnished with the Sickles' cut-off with the latest improvements. Her wheels, of wrought iron, are 38 feet, 8 inches diameter, the buckets of each wheel being in two sections, the buckets of one alternating with those of the other, and one wheel being placed relatively to the other, so as to obviate the trembling and jar generally so perceptible and often so annoying on steamers. The iron rims of the wheels are knife edged to diminish friction.

The boilers are three in number, and instead of being arranged upon the guards of the vessel, are placed entirely below deck, their weight and that of the water they contain thereby giving stiffness and stability to the vessel in heavy weather. This also admits of the guards forward of the paddle wheels being so narrow as to present little obstruction to the sea. The boilers are 35 feet long and 12 feet, 6 inches diameter, flues below and return tubes above. The furnaces, four to each boiler, are in two tiers, one above the other, the flames and heated combustible gases from the two meeting in one connection common to both, where the hot gases and any uncombined air are so thoroughly mixed as to insure perfect combustion. The total amount of grate surface is 510 square feet, and the fire surface 13,850 square feet. This large grate surface is expected to be adequate to burn the coal by natural draft alone, without the employment of "blowers," which, by producing intense combustion in a small space, are very destructive to the boilers. Another advantage of the natural draft is that it ventilates the stoke hole and causes less suffering to the firemen from heat. The boilers are constructed according to a patent obtained by Erastus W. Smith, A.P.D., the constructing engineer for the line. It is expected that, by the use of natural draft and of the fresh water from the condenser, the duration of these boilers will be nearly double that of boilers using salt water and blowers. The condenser contains 4,000 square feet of tubular condensing surface. The tubes are of brass, without seam, drawn from solid ingots, by the American Tube Works, of Boston. They are tinned inside and outside to prevent galvanic action; and, as they are packed with wood ferrules, according to Horatio Allen's patent, all the difficulties of surface condensation, so long troublesome, are overcome.

The steam chimneys are located on the two outside boilers and pass up through all the decks. They are inclosed in a boiler-iron case, firmly riveted and bolted together. Between this case and the steam chimney is an air space of 18 inches the entire hight and circumference, admitting of good ventilation. The case also supplies complete protection to the passengers in case of leaks to the flues or tubes.

The provisions against danger by leakage and fire are admirable. If need be, in case of leakage, the whole capacity of the circulating pump to the condenser can be applied to the bilge, which would discharge two hogsheads at each revolution of the engine. Three other effective pumps also connect with the bilge of the vessel. To provide for the extinguishing of fire there is an independent steam fire pump set apart in a room with a separate boiler, for use when the large boilers are not at work. From this fire pump or engine, branches off a large copper pipe with branches fore and aft the vessel, and up through all the state-room saloons on to the hurricane deck, connecting with numerous smaller branches fitted with freely-opening water gates and coils of hose all ready attached for immediate use. In addition there is an arrangement for extinguishing fire in the hold by steam admitted through pipes, the key of which is intrusted to the engineer only.

The hull was built by Wm. H. Webb, Esq., under the supervision of Capt. Jed. Williams, and the boilers and engine by Messrs. John Roach & Son, of the Ætna Iron Works, this city. In every respect the description of the *Bristol* applies to the *Providence*. Both are marvels of capacity, strength, power, and elegance. They run between New York and Bristol, R. I., where they make connection by rail—a ride of an hour and a half—to Boston.

On the first trip of the *Bristol* to Bristol, R. I., fourteen miles above Newport, in Narragansett Bay, her time was nine hours, fourteen minutes from the Battery, a distance of 160 nautical miles. time never but once surpassed on a similar course. Her subsequent trips have exceeded this time. Mr. Harrison O. Briggs, of Boston, Mass., is the general manager for the company.

ELECTRICAL ANTI-INCRUSTATORS.

We observe that the *Railway Times* gives prominence in two successive numbers to remarks before the Polytechnic Institute on a new remedy for boiler incrustation, as reported in this paper. We do not object to seeing our report credited to another journal, if it is to be construed as countenancing the slender theory there explained as the basis of another patent electrical anti-incrustator. As a company is said to be forming to manufacture apparatus under the patent, and quite possibly may get as much commercial success at the expense of boiler owners as the not much more meritorious contrivances already in the field have met with, a word on the fallacy involved may be opportune for some of our readers.

The inventor bases his expedient on the existence of a positive electrical state in the suspended salts carried up into the steam space. It need not be denied that the low conductivity of steam favors a sustained slight disturbance of electrical equilibrium during its rapid disengagement. But it is needless, too, to point out that uninsulated bodies in connection, like the boiler and its contents, whatever they may be, cannot sustain an active electrical state of any practical consequence. The most they could do in the circumstances would be to supply an indication through a delicate galvanometer. The proposal, therefore, to collect this trivial amount of electric force upon metallic points and convey it to the boiler iron so as to obtain a discharge between the iron and the salts which was not attained before by the free contact of the two, is refinedly visionary. The Doctor should never say a word against homœopathy. As for deposits enveloped within so good a conductor as water, the notion of employing their electrical activity has not even a theoretical basis.

THE ALBANY RAILROAD BRIDGE.

Our engraving represents this structure as it appeared in March, 1866, which was shortly after its completion. Some years have elapsed since the first inauguration of the enterprise, which delay was occasioned by litigation on the part of Troy and other interests upon the river above Albany, but finally all obstacles were overcome, and the work on this bridge was commenced in April, 1864. The first locomotive the *Augustus Schell*, of the Hudson River Railroad, crossed the bridge Feb. 15, 1866, and the first passenger train on Feb. 22.

The bridge proper (omitting the approaches, which in themselves are quite formidable) consists of two abutments and nineteen piers, making a total length of 2,020 feet. The extreme length of the bridge is nearly a mile. The main channel of the river is crossed by four spans of 178 feet between the centers of the piers, on the plan known as "Howe's" and and two draw spaces of 131¾ feet each. The remaining 14 spans over the shallow water on the east side, as also over the basin on the Albany side, are short spans ranging from 75 to 78 feet each, built on the same general plan. The trestle. work approach to the bridge in the city is about 1,500 feet long.

Our view represents the bridge from the Albany Basin to the eastern shore, at seen from the large New York Central Railroad Elevator, which stands a few rods south of the bridge.

The drawbridge, including the iron turn-table upon which it rests, is entirely novel, planned specially for the locality, and the circumstances under which it has been built and will be operated. The piers and abutments are all founded on piles. In some cases the bed of the river was excavated to a depth of ten or twelve feet, and within this space piles were driven to the hard bottom, sometimes as low as thirty-three feet. A heavy timber crib was then built around these piles of the dimensions of the proposed pier, resting on the bottom of the excavation, and reaching to within three feet below water mark. This crib was then filled with concrete and floored with heavy timber, upon which the first stones of the masonry were laid. In other cases, after excavating as before, and driving the piles, the latter were sawed off, and a floating caisson, with a heavy timber floor, of the dimensions of the proposed pier, was anchored over the piles, and the masonry commenced in this caisson, which soon settled to its bearing on the heads of the piles, when the sides were removed by unscrewing some bolts, and floated away to serve elsewhere.

The piers are of cut limestone masonry, with rough faces,

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and are thirty feet in hight above low water, and have a width at the bottom of nine feet, and at the top under the coping (which projects nine inches on all sides) of six and one half feet. They are all built of heavy cut stone laid in cement.

The face stones are all clamped together by iron clamps, and, in addition, the two faces of the pier are tied together by iron bars at intervals on each course along the front, extending through the pier from side to side; and still further to insure the strength of the masonry, the head stones are all dowled together with iron dowels—each stone to the stones both above and below.

The bridge has been constructed by "The Albany Bridge Company," constituted mainly of directors in the different railroads centering at Albany, and it is understood that it is owned one-half by the New York Central Railroad, and one quarter each by the Hudson River and Albany and Boston Roads. The total cost of the bridge has been over a million of dollars.

HOW THE PACIFIC RAILWAY IS BUILT.

From an able correspondent of the Cincinnati *Gazette*. who accompanied the senatorial party, we learn the *modus operandi* of the construction of the great trans-continental road, which is steadily progressing at the rate of two miles per day.

"There is really little known by the people of the character of the enterprise. Most think that a company of capitalists are hastily putting down a rude track, over which cars can be moved with care, for the purpose of securing lands and money from the government. The fact is, that one of the most complete roads of which the country can boast, with equipments that surpass many, is being laid with a speed that fails to impress the nation, simply because it is not believed. But let the facts tell their plain yet wonderful story.

"General J. S. and D. C. Casement, of Ohio, grade the road, lay the track, and put up the telegraph. The graders go first. There are two thousand of them. Their advance is near the Beach Hills. They protect themselves and are digging the great fortification which makes the future sure for us, on through Indian battle fields while the daily fight goes on. Their work is done to Julesburg.

"Of tie-getters and wood choppers there are one thousand five hundred. Their axes are resounding in the Black Hills, over Laramie Plains, and in the passes of the Rocky Mountains. They have one hundred thousand ties in these hills awaiting safeguards for trains to haul them.

"A mile in advance of the track layers are the squads which place the tiers. There are three of these. First, however, the engineers set their leveling stakes at distances of one hundred feet on the straight lines and fifty feet on curves. At each of these points sawed ties are placed and leveled by them. Then come two men with a measuring rod, marking off spaces equal to the length of a rail, and also the half of this space. These sawed ties are laid by the second squad, to give firm support to the ends and middle of each rail. These are placed by sighting along the guide ties already laid. The third squad then place the intermediate ties, and the bed is then ready for the iron.

"Now go back twenty miles on the road and look at the immense construction trains loaded with ties, and rails, and all things needed for the work. It is like the grand reserve of an army. Six miles back are other trains of like character. These are the second line. Next, near the terminus, and following it hour by hour, are the boarding cars and a construction train, which answer to the actual battle line. The one is the camp; the other is the ammunition used in the fight.

"The boarding cars are each eighty feet long. Some are fitted with berths; two are dining halls; one is a kitchen, storeroom and office. Under the whole those men who prefer fresh air have swung hammocks. Rifles are hung overhead, plentiful in number, loaded, and convenient. The party protects itself without attention from the government. The track-laying gang numbers 400. On the 350 miles already built there are 1,000 track repairers constantly improving the road bed.

"The boarding cars go in advance. They are pushed to the extremity of the track; a construction train then runs up, unloads its material and starts back to bring another from the second line. The boarding train is then run back till it has cleared the unloaded material.

"Three trucks, each drawn by two horses, ply between the track layers and their supplies. The horses run outside the track, pulling with a long tow line, as boats are moved on canals. They must be out of the way of the workmen. One of these trucks takes on a load of rails, about forty, with the proper proportion of spikes and chairs, making a load, when the horses are started off on a full gallop for the track layers. On each side of these trucks are rollers to facilitate running off the iron. On reaching the end of the last rail the truck is stopped. A single horse is attached to move it over each successive rail. Meantime, the truck last emptied has been turned on its side to allow the loaded one to go to the front. The two horses released are started back on a keen gallop for another supply. The third one moves up in like manner, and thus through all the day they are rushing forward with their iron load. To see them, and reflect what their rush and roaring means, is as exciting as it ever was to watch a battery thunder into position at a needed moment, at the vital point in its line.

"The rails within reach, parties of five men stand on either side. One in the rear throws a rail upon the rollers, three in advance seize it, and run out with it to the proper distance. The chairs have, meantime, been set under the last rails placed. The two men in the rear with a single swing, force the end of the rail into the chair, and the chief of the squad calls out 'down,' in a tone that equals the 'forward' to an army. Every thirty seconds there came that brave 'down,' 'down,' on either side of the track. They were the pendulum beats of a mighty era; they marked the time of the march and its regulation step.

"One of the rear men drove the cars, in addition to handing the rail. The horses started as each rail fell into his place, the truck rolled on to the end of it; a second rail was projected into the wilderness, with the same precision and haste; then came the magic 'down,' the car moved on again, and another length was accomplished.

"Two spikers followed each rail, one party a little in advance of the other. One rail was fastened at the end and at the middle. The second party then drew the opposite rail to the exact gage, and fastened it at the middle and the end. Then came other squads of spikers, moving along with the precision of military drill, each having a particular spike to drive, and no one interfering with another. Track liners followed these, and with their crowbars rectified the line. The fillers came last. One party of these filled and packed the spaces at the ends and middle of the rails; the other completed the intermediate intervals, and the job was left till the squads of track repairers should come up and finish the ballasting. But as the fillers leave it, full trains can run over it with safety at twenty miles an hour.

"These are the dry details. Let the reader picture the scene. The rush of the loaded truck; the successive dropping of the rails in place; the rattle of the spiker's hammer, sounding like a hotly contested skirmish; the roar of the distant supply trains moving up; the resounding of the frequent signals, near at hand; the universal bustle; the 'rumble, and grumble, and roar' of the wonderful advance. Let the elements of savage warfare and the actual presence of hostile Sioux along the bluffs be woven into the picture, and together it forms one that the world has not seen before, and which the stories of magic can scarcely equal.

"Nor is any of this energy wasted. If it is asked: 'How does the work get on?' again let the facts answer. On the 9th of May, 1866, but forty miles of road were completed. In a hundred and eighty-two working days thereafter two hundred and forty-five additional miles were laid and put in prime condition, every rail, and tie, and spike having been brought up from the rear. Seven saw mills furnish the ties and lumber. All bridges are framed, the pieces numbered, and set up where wanted without the least delay. The bridge at Loup Fork is fifteen hundred feet long, and as fine a Howe truss as can be found in the land. While our train was running the sixty miles from North Platte, over a mile of track had been put down and one train passed over it. From one o'clock till four in the afternoon a mile and two hundred feet were added to this while the party were looking on. The progress was astonishing, and the more so because the ground was wet and the soil stiff and hard with alkali.

"Unless driven off by Indians, which does not now seem probable, the road will touch the base of the Rocky Mountains the coming autumn. The California end has already reached a point about a hundred miles east, and is descending the eastern slope of the Sierra Nevadas into the valley of the Humboldt. It is confidently expected that Salt Lake will be reached next year, and that 1870 will see the whole line completed. While the nation has scarcely heard of what was being done, the work has been near one-third accomplished."

A PHILADELPHIA NEWSPAPER ESTABLISHMENT.

The new and splendid building of the *Public Ledger* newspaper, at Philadelphia, was inaugurated on the 20th inst., and the proprietor made it the occasion of a remarkable festive gathering of remarkable people. Many of the prominent newspaper personages from all parts of the country were present and after inspecting the new establishment the company adjourned to the spacious dining rooms of the Continental Hotel, where a magnificent repast was provided, and many fine speeches were made.

The new *Ledger* building is one of the largest printing houses in the Union, very beautiful in architecture, located on the corner of Sixth and Chestnut streets. Every portion of the establishment is complete with regard to light, heating, ventilation, and other comforts. The office and editorial rooms are furnished splendidly. The composing room is on the upper floor, which, by aid of a Mansard roof, has a hight of twenty-one feet. The main entrance is ornamented by a sculptured coat-of-arms of Pennsylvania, and over the doorway at the corner of the streets, is a pedestal sustaining a statue of Franklin, in whose right hand is a lightning rod, which at night will emit gas jets. At the base of the pedestal is a public drinking fountain. The press room has a hight of over twenty-three feet, contains the Harrison boilers, and is to be filled with Hoe's great presses, folding machines, etc. There is not a more complete newspaper establishment in the world.

The *Public Ledger* belongs to the class of cheap or popular daily newspapers. It has been in existence for more than a quarter of a century, and until the breaking out of the war was always sold at one cent per copy. But taxation has deprived the people of the luxury of penny newspapers, and now the *Ledger* readers pay two cents.

The *Ledger* is one of the best daily newspapers in the country, and wields an immense influence for good, in Philadelphia and vicinity. Everybody reads it, trusts it, and follows its counsels. Any thing published in the *Ledger* is regarded by all Philadelphians as authentic. The *Ledger* has a daily circulation of 70,000 copies, an immense weekly edition, and probably more than half a million readers. The *Ledger* was established by Swain, Abell & Simmons. After the death of the last named, a few years ago, Mr. George W. Childs became the proprietor, under whose auspices the establishment continues to prosper. Mr. Childs is a young man of ability and popularity. His success in life has been well earned, and he understands the responsibilities which rest upon him as the owner of a great newspaper.

One of the peculiaritles of the *Public Ledger*, is an entire absence from its columns of self laudation, puffery, clap-trap, and braggadocio. Its news and its discussions of public questions, have always been characterized by truthfulness, and an apparent desire to disseminate correct information. If it did not agree with its cotemporaries, it never called them knaves and scoundrels, by way of argument; but stated its views dispassionately, and thus acquired universal esteem and respect.

The editorial management of the *Ledger* has always been remarkably excellent, and we think that to this fact the success of the paper is in a great measure due.

The editor-in-chief is Mr. Wm. V. McKean, a gentleman of rare qualities for this responsible position. In person he is rather under the medium stature, of compact organization, nervous temperament, large brain, quick perception, fine taste, well balanced mind, safe, cautious, prudent, a ready writer, an accute observer, thoroughly posted upon all subjects, and full of strong, practical common sense. He is indeed a model editor.

Long may the national banners wave from the proud turrets of the *Ledger* building, betokening prosperity to those within her walls and public confidence in their honorable labors.

FRENCH OCEAN STEAMERS.

We learn from the report of the French Trans-atlantic steam navigation company, presented to its shareholders at their annual meeting held in Paris on the 13th ult., some interesting facts in regard to the speed of vessels belonging to this company. Tables drawn up by the post office authorities show that in eleven complete trips from Brest to New York and return, made by the *Ville de Paris* and the *Pereire* between March 1866, and February 1867, in an interval of about twelve months, comprising both the summer and winter seasons, the average speed was 12·8 knots instead of the 11.5 knots required by the terms of the contract. This speed, says the report, we believe has not been equalled even in England; it exceeds by two-tenths of a knot, the average runs of the celebrated *Scotia*, as stated in official documents. One of the quickest passages on record since the commencement of steam navigation between Europe and America, was made by the *Ville de Paris* between the 21st and 30th of July 1866, the average speed of that steamer having been 13.60 knots in a run of 3,000 nautical miles, from port to port. The propeller *St. Laurent*, in one of her passages made 12.10 knots, running 350 nautical miles in twenty-four hours for four consecutive days. The last passage of the *Pereire*, between Havre and this port, was made in nine days and four hours from dock to dock.

In comparing the relative advantages of screw and side wheel steamers, the report asserts the use of the screw procures for vessels of equal tunnage, a saving of about twenty-five per cent in fuel, with an increase of twenty per cent in speed. The results appear to the directors so satisfactory that two steamers the *Washington* and *Lafayetie*, of excellent nautical qualities, but too slow for present requirements are to be fitted with double screws, which recent successful trials in England and in the French imperial navy prove, possess theadvantage of being more easily and more economically adapted than the single screw to vessels already built. The saving of fuel and increase of space reserved for passengers and freight, it is claimed will more than balance the cost of transformation.

Internal Revenue Decision.

TREASURY DEPARTMENT,
OFFICE OF INTERNAL REVENUE,
WASHINGTON, June 14, 1867.

SIR: In your letter of the 13th inst. you inquire whether a manufacturer of patented articles is bound to return the full price at which they are sold, including the patent fee, or whether he should be allowed to deduct said fee.

In reply I have to say that whenever a patent enters into the combination of an article or machine, giving additional value to the same, and enhancing its cost or price to the purchaser, such patent becomes an element of value, and cannot be separated any more than any other element of value. The actual sales' price, including royalty, must be returned for taxation. Yours, respectfully,

E. A. ROLLINS, Commissioner.

OBITUARY.

HON. ISAAC NEWTON, Commissioner of Agriculture, died at Washington, June 19th, at the age of sixty-seven, having been born in March, 1800. He was appointed in 1861 Chief Clerk in the Bureau of Agriculture, and in 1862 to the position made vacant by his death. The duties of the office he held were not such as permitted the exhibition of brilliancy of talent, but demanded industry, application, and much patient care, qualities which Mr. Newton undeniably possessed. He was a gentleman highly esteemed by those who knew him for his courtesy, affability, and purity of character.

THE "Modern Carpenter and Builder," noticed in our last issue, is published by Howard Challen, No. 1,308 Chestnut street, Philadelphia.

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Photographic.

Mr. Valentine Blanchard has made known a very simple and excellent plan for keeping wet plates in a sensitive condition for a considerable time, after removal from the bath. The plan is to add a few grains of a salt of bromine—cadmium or ammonium—to the collodion. An old collodion works best. We have tried it with success, adding two grains of bromide of ammonium to the ounce of collodion. In some instances our plates remained three hours in the shield before exposure, and developed without surface stains. The rationale of this method is explained as follows by the *Photographic News*:

The value of a bromide in securing immunity from stains, comets, and other markings has long been known; but its mode of operation in doing this has not been well understood. Its action in permitting long keeping, however, is easily explained. The process of double decomposition, in which the bromide salts employed in the collodion are changed into bromide of silver, is much slower, as is well known, than is the conversion of iodides; and when a simply bromized collodion is employed, the immersion in the nitrate bath needs to be very much prolonged, in order to convert the whole of the bromide in the collodion into bromide of silver. In effecting his purpose Mr. Blanchard just pursues the opposite course. Employing a very highly bromized collodion, he gives the plate the shortest possible immersion in the nitrate bath, keeping it in motion from the first, to get rid rapidly of the greasy, streaky appearance of the plate. The solution running evenly over the film, without streaks or oily-looking lines, which is generally regarded as the indication of sufficient immersion, is, in reality, no test of the conversion of the salts in the collodion film into salts of silver; it merely indicates that the alcohol and ether in the film have become thoroughly mixed with the aqueous solution, and that the mutual repulsion has ceased. Under ordinary circumstances, however, by the time this is thoroughly effected, the mutual decomposition of the iodides originally in the collodion and the nitrate of silver, and the formation of iodide of silver and a nitrate of potash, or other base is also complete. With bromides, as we have said, this operation is not so rapidly completed; if therefore, a collodion film containing a large portion of bromide be immersed and kept in motion so as rapidly to get rid of greasiness, and then removed after a very brief immersion, the film will contain a large portion of the bromide—say, of cadmium or ammonium—which remains undecomposed, and is not converted into bromide of silver. In this fact lies the safety of the plate for long exposures. The free nitrate of silver—which would otherwise be crystallizing on the surface of the film, or, by the concentration of the solution caused by evaporation, acquiring a readier tendency to abnormal reduction—now performs a different office: being in contact with the unconverted bromide of cadminm or ammonium, it is decomposed by it, and aids in the formation of bromide of silver in the film. Instead of being made stronger by evaporation of water, the free nitrate is made weaker by the loss of the silver which combines with the bromine, whilst the nitric acid, combining with the base which leaves the bromine, produces an innocuous, or possibly in some cases a hygroscopic, and therefore beneficial salt. It will thus be readily seen how the use of a large portion of bromide and a very short immersion of the plate in the nitrate bath tend to prevent the stains of crystallization or of reduction consequent on long exposure in warm weather. The mode in which the effect in question is secured in the case described may possibly suggest an explanation of the general action of bromides as aids to clean negatives. It is probable in most cases where a freely bromized collodion is employed, and the plate kept in the nitrate bath the usual two or three minutes, that some portion of unconverted bromide remains in the film, and that the formation of bromide or silver goes on after the plate leaves the bath, the bromide of silver being formed at the expense of the free nitrate on the film, which is thus much weakened. As the use of a weak solution of nitrate silver, at times secured by re-dipping the plate in a weak bath, is known to be conductive to cleanliness, the weakening of the free nitrate by the formation of bromide of silver may also be a source of the cleanliness well known as an accompaniment of the use of bromides.

The amount of bromide in collodion for very long exposures may vary from two grains to two and a-half. Any soluble bromide may, we presume, be used without impropriety.

Sheathing Iron Vessels with Wood.

A correspondent gives us an account of a method of repairing an iron steamer running between New York City and South Amboy, which, in fifteen years' service had become very much corroded externally, although her frame was sound. She was taken out of the water and planked with three-inch yellow pine from the keel to the guard braces, the planks being bolted with five-eighth bolts every linear foot, with large square washers on the inside of the hull; an oak keel was also added and the work was done within five weeks. She is 270 feet long and 30 feet beam, and required over 9000 bolts. She is now believed to be good for at least another fifteen years' work. Parties specially interested in the object are advised to investigate the matter. It is very important if as feasible as our correspondent believes it to be.

SOMETHING NEW IN THE MOON.—At a late session of the French Academy of Sciences, M. Delaunay read a paper, by M. Flammarion, on the subject of a recent change in the moon's surface. A crater well defined and perfectly well known to astronomers has disappeared within a year, and its place is now marked by a large white spot in the middle of a plain. It is the first time that any change in the moon's surface has been noticed. M. Chacomar made a like observation.

OFFICIAL REPORT OF PATENTS AND CLAIMS

[Issued by the United States Patent Office,

FOR THE WEEK ENDING JUNE 18, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

65,785.—GLUE.—William Adamson, Philadelphia, Pa.

I claim a glue consisting of size aerated, or treated with gas, substantially in the manner described.

65,786.—PROCESS OF MANUFACTURING AERATED GLUE.—William Adamson, Philadelphia, Pa.

I claim the mode or process substantially as herein described of aerating carbonating size for converting the same into glue.

65,787.—MANUFACTURE OF GLUE.—William Adamson, Philadelphia, Pa.

I claim the combination substantially as described of glue or size with carbonate of soda for the purpose specified.

65,788.—CAR TRUCK.—C. F. Allen, Aurora, Ill.

1st, I claim an eight wheel truck which is composed of two independent four wheel trucks connected together by means of a platform, A, which is supported upon, and connected by pivots to laterally swinging spring beams, arranged substantially as described.

2d, In an eight wheel truck, I claim the combination of the laterally swinging and vertically elastic beams, D D and K, with the side springs, f f, and equalizing beams, D' D', so arranged that the weight of the load upon the center of the platform, A' will be uniformly disposed upon all the axles of the trucks, substantially as described.

3d, The connecting platform, A, constructed of wood and metal provided with a swinging beam, K, and strengthened by means of trusses or braces, J J, substantially as described.

4th, In combination with the bars, b, b', braces, c c, pedestals, a a, steps, e' e', and saddles, e2 e2, I claim the transverse beams, C C, metal boxes, e e, pillow blocks, d d, tu ices straps, g', and the equalizing beams, D D, with their springs and connecting loops all arranged and operating substantially as and for the purposes described.

65,789.—FLOUR BOLT.—Elkanah Bateman, Frederick City, Md.

I claim the buckets, n, arranged and operating in combination with the bolting cylinder and fan, substantially as herein set forth.

65,790.—CAR SPRING.—Julien F. Belleville, Paris, France.

I claim the spring composed of trunco-conical disks having the form and proportions herein specified, arranged in pairs, united by means of a rod passing through the center of the said disks as shown and set forth.

65,791.—FAUCET.—Marshall Burneet, Boston, Mass.

I claim a faucet having the cylinder, C, valve, F, cone, H, and cam lever, I J, all constructed and arranged substantially as shown and described.

65,792.—FLOAT OR RAFT.—Andrew Carson, Memphis, Tenn.

1st, I claim constructing a float for saw mills or the purposes herein described, by securing a sufficient quantity of light timber or other material together in a solid mass, and supporting a platform on the same, substantially as herein described, for the purpose set forth.

2d, I claim attaching side floats to the main float, for steadying the structure, and making room to deposit the sawed lumber, as herein described.

65,793.—GRAIN DRYER.—Lewis S. Chichester (assignor to himself C. W. Mills and G. H. Nichols), Brooklyn, N. Y.

1st, In a grain drying apparatus, I claim a chamber above the fire into which air is admitted in large volumes and descends and mingles with the products of combustion and passes into the grain dryer, substantially as and for the purpose specified.

2d, I claim the arrangement of the hot and cold air flues, f and n, trunks, g org' and valves, l l,' and m m', for regulating the temperature of the air passing into the grain drying chamber, k, substantially as specified.

3d, I claim a series of half pipes crossing the grain chamber and opening at or near both ends into air spaces or flues as set forth, so that the current of air shall pass through and beneath the half tubes and in contact with the grain as set forth.

65,794.—MACHINE FOR FILLING CYLINDRICAL MOLDS FOR RUBBER GOODS.—J. W. Cobb, Melrose, Mass.

I claim so connecting by gear or otherwise the pattern roll, M, with the filling roll, R, that the said filling roll, R, shall always revolve with greater rapidity than the pattern roll, M, made substantially as described and for the purpose set forth.

65,795.—SLATE FRAME.—J. M. & John Connel, Jr., Newark, O.

I claim a corner casing of elastic or resilient material constructed substantially as described to hook into notches in the edges of the slate.

65,796.—WOOD PLANING MACHINE.—W. H. Doane and W. E. London, Cincinnati, Ohio. Antedated Dec. 18, 1866.

1st, We claim the combination of two or more removable tonguing and growing cutter heads, having attaching stems, formed on or applied to them, two or more spindles with their upper ends below the surface of the planing bed, and a rotary planer, constructed and arranged so as to operate substantially as and for the purpose set forth.

2d, Placing the beading shaft of a planing and matching machine within or upon the pressure bar for the several purposes and in the manner described.

65,797.—AXLE BOX.—D. H. Dotterer (assignor to himself and Dillwyn Parrish, Jr. Philadelphia, Pa.

1st, I claim the hollow roller, B, having openings arranged substantially as described, for permitting the lubricating material to pass through the said roller to the stationary pin, E.

2d, The said stationary pin, E, and its longitudinal groove, q, in combination with the hollow roller and its openings.

3d, The stationary pin, E, arranged within the box and confined thereto by the detachable cap or follower, k, and substantially as described.

65,798.—GANG PLOW.—C. L. Eastham, Rhodes Point, Ill.

1st, I claim the combination of the axle, A, and hinged bar, C, provided with the lever, l, and having the plows attached thereto as described, all constructed and arranged to operate substantially as set forth.

Second, The combination of the lever, L, connected to the plow beams and having a fulcrum at or near the axle, with the elbow lever, E, pivoted to the tongue or equivalent part arranged to operate as described.

65,799.—CAR REPLACER.—N. H. Edgerton, Pottsville, Pa.

1st, I claim the reversible and detachable canting block, K, secured to the rail, A', and the depressed foot, n, substantially as described.

2d, I claim the plated incline, D, having a projecting foot, m, in combination with a canting block, K, adjusted substantially as described.

3d, I claim the combination and arrangement of my second claim with the inclined block, C, when both are constructed and operating substantially as described.

65,800.—SPECTACLE.—George D. Edmondson (assignor to himself and Albert R. Clark), Detroit, Mich.

I claim the spectacles with lenses each of which consists of two pieces of different relative convexity and set at a different angle in the bezel, substantially as described.

65,801.—ROCK EXCAVATOR.—W. H. Elliot, New York City.

1st, I claim the combination of car, a, track, h', and drilling machine, e, when said machine is suspended from a car, substantially as herein shown and described.

2d, Platform, c, in combination with car, a, and drilling machine, e, substantially as and for the purpose herein set forth.

3d, Adjustable support, f and f', in combination with car, a, and drilling machine, e, substantially as and for the purpose herein shown.

4th, Frame, m'', in combination with drilling machine, e, and platform, c, for the purposes herein set forth.

5th, Braces, o, in combination with platform, c, substantially as and for the purpose herein set forth.

65,802.—DRILLING MACHINE.—W. H. Elliot, N. Y. City.

1st, I claim the carriage, k, with springs, n or n', in combination with cranks, h', and drill spindle, l, when operating substantially as herein shown and described.

2d, Projections, n', and a corresponding collar on the drill spindle, in combination with spring, n, when employed substantially as and for the purpose herein specified.

3d, The combination of crank, h', drill spindle, l, and spring, n, when employed as devices for producing excess of motion in the drill spindle over that given to the connecting rods by the cranks which shall cause the machine to feed towards the rock, substantially as shown.

4th, The pawl, u, and rack, u', when acted upon by devices producing excess of motion in the drill spindle over that of the connecting rods for the purpose of feeding the machine towards the rock, substantially as herein set forth.

5th, Plate, m', with its diagonal edge when acting on the notches on the collar, m, to revolve the drill when operated upon by devices producing excess of motion in the drill spindle over that of the connecting rods, substantially as shown and described.

65,803.—PACKING PUMP JOINTS.—Benaiah Fitts, Newark, N. J.

1st, I claim the packing composed of india-rubber, or other similar substances, formed or constructed substantially as set forth and described, that is to say, a packing made by applying the prepared india-rubber in the plastic state to the different surfaces as shown, and compressing it to fit all the inequalities, recesses or grooves in the metal, and being made in vulcanizing to adhere firmly to one part of the metal leaving the other to be freely removed.

2d, I claim a pump valve composed of a metallic case in which is confined india-rubber adhering to the metal by being vulcanized therein and forming an elastic face, as described.

65,804.—FRUIT PARER.—D. H. Goodell, Antrim, N. H.

I claim the combination of the arm, V, with the notched slot, S, in the plate, for the purpose described.

I also claim the described fruit parer, when all its parts are arranged and operated as set forth.

65,805.—CIGAR-MAKING MACHINE.—John Hafer and J. A. Henderson, Bedford, Pa.

1st, We claim the packing tube, C, arranged and operating as described.

2d, The combination as described of a fixed hopper tube or feed pipe with a reciprocating tube, for the purpose set forth.

3d, The combination substantially as described of a fixed hopper tube or feed pipe with a plunger reciprocating inside and a packing tube reciprocating outside the feed pipe for the purpose of filling a wrapper with fine-cut tobacco.

65,806.—SORGHUM STRIPPER.—David Hain, H. A. Gross and Martin Hain, Gasconade county, Mo.

1st, We claim two pairs of semi-elliptical knives, c2 c3, one pair of which is to be placed in front of the other, substantially as described and set forth.

2d, We claim the flexible handles, c c', in combination with the knives, c2 c3, for the purpose of allowing the said knives to yield readily to any variation in the size of the stalk passed between them.

3d, We claim the knife handles, C', and the toggle bars, D, when combined as herein described and set forth for the purpose of opening or raising the knives, C3.

4th, We claim the knife handles, C', the toggle bars, D, the spring, D2, or its equivalent, the rod, D', the link, d, and the treadle, D3, when constructed and arranged substantially as herein described and set forth.

65,807.—TYPOGRAPHIC MACHINE.—Tho. Hall, Bergen, N. J.

1st, I claim weights attached to the type levers when they are so arranged that they act with less power when the type is making its impression than at any other position.

2d, The stop mechanism, 1111, and hollow shaft, 2, substantially as described.

3d, The arrangement for moving table, by varying length of levers to suit each type, substantially as described.

4th, The method of spacing between letters and words by a variable length of lever, J, by which the space for each letter is increased or diminished equally, substantially as shown.

5th, Moving paper by the clutch, n, on straight rod, m, substantially as described.

6th, Lever, Q, and connections for moving table, substantially as described.

7th, Parallel motion for moving table backward and forward, substantially as described.

8th, Ring, R, or its equivalent, for stopping type when making an impression.

9th, Automatic stop operating when the printing has reached the end of the line, substantially as described.

10th, Varying the length of movement of the table, P, or substance to be printed upon by causing the keys to move different distances before acting on the feed mechanism.

65,808.—ELECTRIC APPARATUS FOR LIGHTING GAS ENGINES.—Oscar Hammel, Jersey City, N. J.

1st, The arrangement of the battery, B, coil, C, pendulum switch, G, and electric hammer, E, all constructed and operating substantially as and for the purpose set forth.

2d, The pendulum switch, F, in combination with the slide, H, or its equivalent, constructed and operating substantially as and for the purpose described.

3d, The electric hammer, E, in combination with the slide, H, or its equivalent, and with the pendulum switch, G, constructed and operating substantially as and for the purpose set forth.

4th, The saddle, p, on the electric hammer, E, in combination with the serrated bar, q, on the slide, H, or its equivalent, constructed and operating substantially as and for the purpose described.

65,809.—LEMON SQUEEZER.—Oswald Hesselbacker and Henry Moesta, Detroit, Mich.

1st, I claim the construction of the frame of a lemon squeezer of the parts, A and B, and a circular bracket, C, which latter is adapted for receiving and supporting a straining cup, D, beneath a plunger, E, substantially as described.

2d, The combination of the vibrating slotted cam lever, G J, and plunger, E, with the cup, D, and its supporting segment, C, constructed and arranged substantially as and for the purposes described.

65,810.—SEED PLANTER.—C. T. Holman, Conneautville, Pa.

1st, I claim perforating the shank of the furrowing tooth and arranging the seed tube to pass through it, substantially as described.

2d, I claim arranging the hoppers on and hinging the furrowing, seeding and covering fixtures or devices to the blocks, J J, arranged to traverse between ways and adapt the planter to rows of different widths, substantially as described.

3d, And in combination with devices hinged to the blocks, J J, I claim the swinging bar, Q', worked by the cam, Q, and so arranged as to work and operate the several parts in the different portions in which they may be placed to vary the width of the rows planted.

4th, I claim making the swinging bar, M', which connects the shank of the furrowing to oth to the link so long that the tooth and link may be traversed on it, substantially as described, in adjusting the machine to rows of different widths.

65,811.—WATER ELEVATOR.—Thomas Holmes, Bristol, R. I.

I claim the combination of the brake lever, G, and pawl, F, with the gear wheels, D C, when arranged substantially as described and for the purpose set forth.

65,812.—BREECH-LOADING FIRE-ARM.—W. W. Hubbell (assignor to himself and J. H. Orne), Philadelphia, Pa.

1st, I claim the breech, B, with its rear face, c, secured firmly in the concaved front of the ordinary screw base, a, of the barrel by the fixed shaft or center, b, with this breech, B, operating the breech, C', under the side ribs, n', by means of the link, D, and locking by their faces, f and e, and by the projection, d, into the bore of the barrel, all within the recess substantially as described.

2d, The detachable cheek pieces, E E, arranged for the introduction of the breech, C', to and its withdrawal from the recess and the rear of the barrel, substantially as described.

3d, The single retracting bar, G, moving in a groove, 4, in one of the two opposite sides of the recess, both in loading and extracting the cartridge shell by the projection, 5, in the slot, 9, and intercepted at each end of the latter by the breech, C', substantially as described and shown.

4th, The stationary rear striker, I2, and the breech, B, and its striker, I1 operating together as described both with and without the front striker, I, when the ends of the striker and breech pieces are beveled, substantially as specified.

5th, The ribs, n', in combination with the rear space, w, and with the retractor, G, to insure the insertion of the flange of the shell in the rear of the retractor head, 6 as described.

6th, The combination of the breech, B, link, D, breech, C', retractor, G arm, F, with the strikers, constructing and operating together successively in the recess and with the barrel to insert, fire, withdraw, add eject the primed ammunition or shell, as described.

65,813.—COUGH MIXTURE.—P. M. Huffman, Harvard, Ill.

I claim a cough mixture which is composed of the several ingredients mixed together in about the proportions specified.

65,814.—CARPET LINING.—M. A. Johnson, Lowell, Mass.

I claim as a new article of manufacture a felted hair hat, or its equivalent, covered with strips of paper on one or both of its sides, and leaving intervening uncovered spaces between the strips for the dust to pass through.

65,815.—SHOE HOLDER.—L. C. Keeler, Montrose, Pa.

I claim a shoe holder constructed as described consisting of the standards, B B', one or more, provided with hooks, a, stirrup or plate, A, and clasp, D, substantially as herein shown and described.

65,816.—PARLOR TENPIN ALLEY.—E. W. Keyes, Boston, Mass.

I claim a parlor alley made with movable or folding buffers, D D', substantially as described and for the purpose set forth.

65,817.—CONSTRUCTION OF SIGNS.—G. H. Kitchen, New York City.

I claim a prismatic illuminator formed of an opaque case with openings to which prisms are applied, substantially as and for the purposes set forth.

65,818.—APPARATUS FOR WASHING AND SEPARATING COAL.—C. A. Comp, New York City.

1st, I claim the arrangement of the grinding rollers, C, and elevator, D, in combination with the assorting drum, E, consiructed and operating substantially as and for the purpose set forth.

2nd, The arrangement of the assorting drum, E, in combination with the separating machines, G, constructed and operating substantially as and for the purpose described.

3d, The arrangement of the drying drum, A, in combination with the separating machines, G, and assorting drum, E, constructed and operating substantially as and for the purpose set forth.

65,819.—FENCE.—I. L. Landis, Lancaster, Pa.

I claim so constructing the panels of a fence that one of the rails of each panel shall overlap the corresponding rail of the adjoining panel and secure the same together by a wire fence, in the manner specified.

I also claim specially the mode of fastening shown in Fig. 5.

65,820.—CIRCULAR COKE OVEN.—F. J. F. Laumonier, Augers, France.

1st, I claim a circular coke oven composed of any suitable number of radial compartments converging toward a central chimney, substantially as herein described.

2d, The combination with the radial compartments of a circular coke oven as described of the flues for conducting the products of combustion from the said compartments to the central chimney under the arrangement herein shown and specified.

3d, The combination with the radial compartments provided with openings in their top of the circular railway passing over the said openings, as and for the purposes set forth.

4th, The application and use in connection with the herein-described coke oven of the water conduit or pipe encircling the same, substantially as and for the purposes herein specified.

65,821.—SHAFT COUPLING.—W. E. London and John Richards, Cincinnati, Ohio.

We claim the use of two conical sleeves within two separate conical shells arranged to act independently on each shaft and forming the two halves of a shaft coupling, as herein set forth and described.

65,822.—MELODEON.—La Fayette Louis, Providence, R. I.—Antedated June 11, 1867.

1st, I claim combining with a tremolo valve, h, hinged directly to an immovable or fixed valve seat, an auxiliary valve, g, for regulating the direct passage of the air from the reeds to the bellows, substantially as described.

2d, I also claim in combination with the valve, h, the lever, m, and its counter-balancing weight, q, when this lever is pivoted or hung directly in or to the valve board, substantially as set forth.

3d, Applying such weight to the lever by means of an adjusting screw, substantially as set forth.

4th, Combining with the valve, g, the buttons, r, made adjustable with respect to the valve seat, substantially as described.

5th, Also combining with a tremolo valve, h, and a direct passage valve,

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a lever extended down from the valve to such position that it may be operated by the knee or foot of the performer, substantially as set forth.

65,823.—APPARATUS FOR HEATING CHEESE VATS.—Henry W. Millar, Utica, N. Y.

1st, I claim, in combination with one or more cheese vats, a heater constructed of metallic pipes, substantially as herein described and set forth.

2d, Connecting a coil of metallic pipes which forms either wholly or in part the heater of a cheese vat with one or more perforated pipes, G, placed in said cheese vat, substantially as herein described and for the purpose specified.

3d, In combination with a cheese vat and a circulating heater for said vat, the arrangement of the heating pipes, G, and the cool water pipe, E, substantially as herein described and for the purpose specified.

4th, The combination of the pan, H, with a coil heater, D, and one or more cheese vats, when constructed and arranged substantially as herein described and for the purposes specified.

5th, The use of the eccentric legs or levers, in combination with a cheese vat, constructed and operating substantially as herein described and set forth.

65,824.—LIFE BOAT.—M. V. Nobles, Elmira, N. Y.

1st, I claim covering the hold of a life boat with a flexible air and watertight covering supported by and fastened to a sustaining frame, substantially as described.

2d, I also claim making the cover of a life boat of double rubber or other cloth with air space between, so that it may be inflated and thus made more buoyant, substantially as described,

3d, I also claim ventilating the hold of a life boat through a hollow mast furnished with separated passages whether by natural or artificial currents of out-going impure and incoming fresh or pure air, substantirlly as deseribed.

65,825.—BOAT-DETACHING TACKLE.—M. V. Nobles, Elmira, N. Y.

I claim, in combination with hinged and dropping holding heads, the lifting and lowering rods, l. and the locking and unlocking arms, b, all operated by one lever or one shaft so that the whole may be within the control of one person, substantially as and for the purpose described.

65,826,—METHOD OF UNLOADING GRAIN.—Isaac H. Palmer, Lodi, Wis.

1st, I claim valves in the floors of cars, carriages, etc., for drawing off grain or other materials without handling the same, substantially as described.

2d. The slide valves, b, in combination with the racks, e, pinions, i, and shatt, D, substantially as described.

3d, The pivoted valve, c, in combination with crank, i, substantially as described.

65,827.—GLOVE FOR HUSKING CORN.—Albert W. Preston, Mazon, Ill.

I claim a husking glove made to cover the back of the hand, thumb, and fingers, and the fronts of the ends or first joints of the thumb and fingers with a strap around the thumb and wrist, substantially as shown and described.

I claim a husking glove with the front of the fingers and thumb covered or shod with sheet metal, substantially as described.

And in combination with the plate on the thumb, I claim the spur or projection, G, on said plate.

And in combination with the plate on the forefinger, I claim the spur or projection, K, on said plate for opening the husks on the ears of corn.

And in combination with the plate on the forefinger and the spur for opening the husks, I claim the projection or arm, J, to rest on the back of the middle finger to prevent the plate from turning on the forefinger.

I claim making the backs of the fingers to lace up, substantially as described, so as to adapt the glove to fingers of different sizes.

65.828.—MILK CAN.—William Ralph, Utica, N. Y.

1st, I claim the socket, a, when applied substantially as described for the purpose mentioned.

2d, The combination of the plate, B, socket, a, and handle, C, for the purpose set forth.

65,829.—STAY OR BRACE FOR BOOTS OR SHOES.—Timothy K. Reed, East Bridgewater, Mass., assignor to himself and Elmer Townsend, Boston, Mass.

I claim the application and arrangement of a metallic brace stay or cap with respect to the junction of the sides of the slit in the upper of a balmoral boot or shoe, as herein described.

Also, as an improved manufacture, a balmoral boot or shoe as provided with a stay brace or cap arranged with respect to the junction of the sides of the slit of its upper, as hereinbefore explained.

65,830.—PROCESS OF REFINING IRON, STEEL, AND OTHER METALS.—Jacob Reese, Pittsburgh, Pa.

1st, I claim refining iron, steel, and other metals, by means of a blast of atmospheric air, or other de-carbonizing blast in a refinery or furnace heated with coke or other carbonaceous fuel, when a layer of metallic oxide is interposed between the fuel and the metal under treatment, for the purposes hereinbefore set forth.

2d, The use of a covering of metallic oxide for protecting metals from the influence of carbon, substantially as hereinbefore described.

3d, The use of hydro-carbon liquid, vapor, or gas, in the procecs of refining iron or steel, in the manner substantially as hereinbefore described.

4th, The use of a hydro-carbon liquid, vapor, or gas, for the purpose of removing sulphur and phosphorus, or either of them, from iron, steel, or other metals, in the process of refining, substantially as hereinbefore described.

65,831.—MACHINE FOR MAKING FISH BARS FOR RAILROAD RAILS.—Jacob Reese, Pittsburgh, Pa.

I claim the combination of the moving die, o, and stationary grooved die, o', with the punches, s' s', operating and arranged substantially as described for the purpose of pressing, punching, and bending fish bars at one operation.

65,832.—MACHINE FOR STRAIGHTENING CYLINDRICAL BARS OF METAL.—Jacob Reese, Pittsburgh, Pa.

1st, I claim rolling and straightening cylindrical rods, bars, shafts, and tubes or pipes of iron, steel, or other metals, between the conical faces of revolving disks or the conical ends of revolving rolls, arranged substantially in the manner and for the purposes above set forth.

2d, The pair of revolving cone-faced disks, arranged as described, so as to revolve in opposite directions, having their axes of revolution inclined so as to bring their operative faces, forming the bite of the disks, parallel to each other, and having their axes in slightly different planes for the purpose of giving a combined rotary and forward motion to the metallic rod bar shaft or tube held between the bite of the disks, substantially as hereinbefore described.

3d, The combination of a pair of rolls or disks, d d' having conical ends or faces, with the restroller, n, arranged and operating substantially as hereinbefore described.

4th, The combination of the screw, p, with the axle, b', and disk or roll, d', for the purpose of increasing or lessening the distance of the disk or roll, d', from its corresponding disk or roll, b, substantially as above described.

65,833.—PAPER BRIM.—C.E.Richards, North Attleboro, Mass.

I claim a braid or band composed of a series of paper threads or strands united together, and to be used as and for the purposes set forth.

65,834.—SULKY PLOW.—John C. Rogers, Alden, N. Y.

1st, I claim connecting a sulky to a plow by means of the link or universal joint D1, or equivalent, for the purpose and substantially as herein described.

2d, The combination and arrangement, with a plow of common construction, of the rack, D, link, D1, pinion, E, crank shaft, E1 F, weighted pawl, G, and ratchet wheel, G1, all arranged upon a sulky, in the manner and for the purpose substantially as described.

3d The projection, d2, or equivalent, formed upon or connected to the lower end of the rack, D, in rear of the link or universal joint, D1, for the purpose and substantially as described.

4th, The spring rods, I I, when constructed and used for the purpose, substantially as herein set forth.

5th, The jaws, J, in combination with the pole of a sulky plow, for the purpose and substantially as described.

65,835.—WINDOW-SASH SUPPORTER.—Blaney E. Sampson, Boston, Mass., assignor to himself and J. B. Proctor, Fitchburg, Mass.

I claim the combination as well as the arrangement of the inclined plane, b, the roller, c, the carrier rod, d, its arm, f, or arms, f f', the spring, e, and the spring latch, l, arranged in the window frame, the whole being substantially as described.

65,836.—MODE OF BOXING OIL CANS.—David Saunderson, (assignor to John Ringer), St. Louis, Mo.

I claim the combination of the wooden box, B, can, F, and wedge, A, as above named and described and for the purposes set forth.

65,837.—SAD IRON.—William Siefert, New York City.

I claim a sad iron having stem, C, with spiral spring, s, and projection, a, thereon, in combination with the slot, v v', with the upward projection therein, as described, when constructed, arranged, and operating as herein specified.

65,838.—COMPOSITION FOR MATCHES.—E. K. Smith, Philadelphia, Pa.

I claim a composition, consisting of the materials described, for the purpose specified.

65,839.—NUMBERING MACHINE.—Sam. Soule, Milwaukee, Wis.

1st, I claim the stamp frame with its shaft and plate, J, cylinder, a, ratchet, S, type wheels, v v v, frames, B C, dog, d, and dogs, e f, all constructed and arranged substantially as and for the purposes set forth.

2d, The arrangement of the arm, E, plate, F, roller frame, H, with rollers, K R, and spring, c, in combination with the revolving table, M, and screw, P, when used in the manner and for the purposes set forth.

3d, The guide frame, X, and rubber, Z, for regulating the printing of the type by means of its slide, x2, in the manner and for the purposes specified.

65,840.—MEDICAL COMPOUND.—Jas. H. Sperling, Peru, Ill.

I claim the combination of the said ingredients in the proportions designated substantially, and applied in the manner set forth.

65,841.—DITCHING MACHINE.—Nathan Starbuck, Wilmington, Ohio.

I claim the combination of the vertically adjustable yoke, F, cutting wheel, G, lever, H, scraper, I, suspended in the rear of said wheel, G, to the hinged pendant, g, and fender, K, arranged and operating as and for the purpose herein set forth.

65,842.—METHOD OF BOTTLING MINERAL WATERS.—Charles H. Thomas, Philadelphia, Pa.

1st, I claim bottling or drawing water from mineral wells or springs under pressure, substantially as described.

2d, I claim taking the water from a point in the well or spring below the point of discharge, substantially as described.

3d, I claim the use, in a universal well or spring, of the perforated diaphragm, a, as herein set forth.

4th, I claim the charging of mineral waters with an extra supply of gas, either in the well or in the tank, substantially as herein described.

65,843.—AWL.—S. E. Totten (assignor to himself and Cyrus L. Topliff), Brooklyn, N. Y.

I claim an awl, having a longitudinal groove, D, as herein set forth for the purpose specified.

65,844.—PRESERVING FRUIT.—W. H TRISSLER, Cleveland, O.

I claim the pipe, D, and plate, B, as arranged in combination with the can, A, when used for the purpose and in the manner described.

65,845.—MODE OF DRESSING SIDE STRAPS FOR HARNESS.—James F. Valentine, Union County, Ohio.

I claim the combination and arrangement of the knives or bits, f f, with the box or trough, together with the levers, b b, the pin or bolt, c, and the widening or regulating screws, d d, substantially as set forth and for the purpose therein named.

65,846.—APPARATUS FOR BURNING PETROLEUM AND OTHER HYDRO-CARBONS.—Henry C. Van Tine, Pittsburgh, Pa.

I claim the use of a fire pan filled or partially filled with gravel or small stones and supplied with petroleum or other hydro-carbon fluid by a pipe or pipes, in combination with a perforated pipe or pipes for admitting jets of steam into the fire space above the surface of the gravel, substantially as and for the purposes hereinbefore described,

65,847.—COMBINED COTTON PLOW AND SCRAPER.—Thos. P. Warren (assignor to Warren & Woodhouse), Norfolk, Va.

1st, I claim the standard, B, having the broad flange, x, the slots, b b, and the arm, z, substantially as and for the purpose described.

2d, The combination of the standard, B, and the flanged supporting attachment, C, substantially as and for the purpose specified.

3d, The scraper guide, K, attached to the landside in the manner and for the purpose above shown.

65,848.—MANUFACTURE OF SORGHUM SUGAR.—Rufus Watson and Thomas Spencer, Central College, Ohio.

1st, We claim the herein described process of granulating sirup; the said process consisting in having the sirup flow over a shelf or shelves, or their equivalent, of suitable length and inclination, so as to effect granulation, substantially as described.

2d, We claim the apparatus constructed substantially as herein deseribed, for the purpose set forth.

65,849.—TEA CANISTER.—Wm. Welbourne, Preston, Great Britain.

I claim a canister having partitions and doors arranged and operating substantially in the manner and for the purpose described.

65,850.—POT FOR LEAD BATH FOR TEMPERING STEEL, ETC.—Charles V. Wilson, Newark, N. J.

I claim the pot or bath made of wrought and cast iron combined substantially in the manner and for the purpose hereinabove specified.

65,851.—LAMP BURNER.—Moses B. Wright, Meriden, Conn.

I claim a lamp burner provided with two wick tubes, b e, one of which, e, is placed above and not surrounding the other, b, and which communicates with a closed chamber below, substantially in the manner and for the purpose set forth.

65,852.—MODE FOR FURLING AND REEFING SAILS.—William Wyatt, New Bedford, Mass.

I claim the combination and arrangement of the furling and reefing topgallant sails and royals by means of head lines and luff lines running through blocks on the upper and under sides and ends of the yard, and travelers affixed to the sail and running in grooved ways formed by securing metallic plates to the yard, as herein described, operated by raising and lowering the yard as set forth, for the purpose specified,

65,853.—MACHINE FOR MAKING MATCH SPLINTS.—Chas. L. Zeidler, Cincinnati, Ohio.

I claim the knife constructed in one piece, with punches, K K, and rearward prolongations, J J', all as herein described and for the purposes specified.

65,854.—HOOP SKIRT.—Ephraim Adams, Jr., Attleboro, Mass.

I claim the combination of the bustle springs, e, and the central tape, d, substantially as described for the purpose specified.

65,855.—METALLIC PAINT KEG.—James C. Adams, Philadelphia, Pa.

I claim a metallic paint keg having its top formed by turning over the edge thereof flat, twice, substantially as shown and described.

65,856.—MACHINE FOR FASTENING BALE TIES.—Joseph Adams, New Orleans, La.

1st, I claim the mortise, C, in the bed of the machine, to admit the tie buckle or fastening and to accomplish its adjustment to the hoop by the same motion which bends the hoop.

2d, The spring, G, as set forth above.

3d, The indentation or oval shape in the handle, at the point, I, and at the points, H H, to form the bend over and under the spring, G, substantially as described and represented.

65,857.—STOPPER FOR BOTTLES, JUGS, ETC.—J. B. Alexander, Washington, D. C.

I claim the bore, I, figs. 1 and 2, the plug, E, fig. 1, the plug, F, fig. 2, the screw, H, and auxiliary piece, G, fig 3, in combination with the rod, C, and the plates, B and D, and the body, A, substantially as described and for the purpose set forth.

65,858.—WASHING MACHINE.—George Arnold and Jacob Greve, Cleveland, Ohio.

1st, We claim the rubbing board, C, as arranged in combination with the board, D, provided with angular notches, a', arms, L, and springs, O, for the purpose and in the manner set forth.

2d, The rubbing-board, C, rollers, L L', as arranged in combination with the roller, J, springs, E, and box, A, as and for the purpose described.

65,859.—LAPPING-BRAID.—William Rhodes, Providence, R. I.

I claim 1st, the machinery for measuring and lapping braids, tapes, etc. having a shifting and positive stop motion, substantially as herein described.

2d, The sliding shaft, a, the spring, c, the pin, g, and the cam, b, on the gear wheel, C, combined and operating substantially as and for the purposes herein described.

65,860.—STREET LANTERNS.—J. P. Avery and W. L. Nichols, Norwich, Conn.

We claim, 1st, The combination with the lantern head or frame of air tubes, b, arranged for supply of air to the flame substantially as specified.

2d, The independent frames, D E, in combination with the rope or cord packing, d, arranged to fit a groove, c, in one frame and clamped or held together to hold the frame in between them essentially as herein set forth.

65,861.—FEED ROLLERS FOR LAMP WICKS.—Charles H. Bagley, Elgin, Ill.

I claim a tooth or pronged roller drum or cylinder, made from a strip or strips of sheet metal or other suitable material provided with teeth along one or both of its edges and spirally wound into the form of a cylinder or other equivalent shape, substantially as and for the purpose described,

65,862.—NON-FREEZING WATER GATES.—Alfred M. Bailey, Middlefield, Conn.

1st, I claim the within described method of protecting moving parts from freezing, the same consisting in enclosing the parts at or near the water level within the casings which contain a fluid supported by the water and not liable to congelation, while the water outside of said casing stands at or near the same level and is prevented by said casings from displacing the same, substantially as and for the purpose herein specified.

2d, I claim floating either form of the enclosed tube and connected parts of the above described apparatus so that it shall rise and sink with the water in which it is supported or with the ice which becomes attached thereto, substantially as herein specified.

65,863.—DEVICE FOR TAPPING CEMENT-LINED PIPES.—Geo. H. Bailey, Jersey City, N. J., assignor to the American Water and Gas Company.

1st, I claim the combination of the tap, D, bored through from end to end, with the combination iron and cement pipes, substantially in the manner and for the purpose described.

2d, The constructing the flange, a, upon the tube or nipple at an intermediate point between the ends thereof, as shown in Fig. 4 of the drawings, so that when the device is applied to a cement lined pipe the cement lining shall not be liable to break off in tapping, substantially as described.

65,864.—WOOD TURNING LATHES.—Frederick Baldwin, Bratteboro', Vt

1st, I claim the method as herein substantially described, of operating the cutters, on the rotating disk, A', by means of the dogs, h k, the spring, i, the toe, J, the collar, o', the pin or rod, p, and the arm, L, which are moved and operated by the the revolving pattern through the rod, m.

2d, I claim the clutch, V', which is placed between two bevel gears, for the purposes described and which is operated by a shifting lever and a sliding bar substantially as set forth.

65,865.—COTTON PRESSES.—W. C. Banks, Como Depot, Miss.

I claim in combination with a cotton press substantially such as described, the pivoting at one end of the beam that carries the screw plates and sweeps, and the curved guide, or frame, F, and windlass and cords, or their equivalents for moving said beam, substantially as, and for the purposes herein described and represented.

65,866.—HYDRO-CARBON FLUID FOR CARBURETING GAS.—John A. Bassett, Salem, Mass.

1st, I claim a hydro-carbon liquid used for the purpose above named, produced by the combination of the coal and petroleum hydro-carbons, as described and set forth.

2d, Adding to the photometric valve of gases by carbureting with the hydro-carbons produced by the combination of the light products of the distillation of coal and petroleum.

3d, The process substantially as set forth of manufacturing hydro-carbons for carbureting gases by combining the hydro-carbons of coal and petroleum in variable proportions as set forth.

65,867.—CORN HUSKER.—E. M. Bates, East Rochester, Ohio. Ohio.

I claim a curved or scroll corn husker constructed in the manner and for the purpose described.

65,868—CORN SHELLER.—F. A. Bolles, Unadilla, N. Y.

I claim combining with a stationary concave a yielding shelling cylinder, by means of springs as shown and described, said springs may be made of rubber or steel or any other suitable materal, when constructed as and for the purpose as herein specified.

65,869.—METHOD OF SUPPLYING LOCOMOTVE TENDERS WITH WATER.—Walter J. Brassington, Brooklyn, and William Burtnett, New York City.

1st, I claim an air tight tender tank of a locomotive engine, provided with a pipe communicating with the locomotive boiler, also with devices for attaching a pipe which is designed to lead into a reservoir or well of water, for the purpose of supplying said tank with water, substantially as described.

2d, The combination of the secondary air tight water tank, E, and its spray pipe, f, with the primary tank, C, substantially in the manner and for the purposes described.

3d, The arrangement with an air tight tender tank, C, and pipes A and D, of reservoir, G, which is constructed to operate substantially as specified.

65,870.—WASHING-MACHINE.—Alex. Brooks, Waverly, N. Y.

1st, I claim The combination of the circular slats, or ribs, B, circular plates, C, and breast beams, D, with each other, and with the box, A, of the machine, substantially as herein shown and described and for the purpose set forth.

2d, The pivoted hammer E, and weight, H, constructed arranged and operated substantially as herein shown and described in combination with the box, A, as and for the purpose set forth.

65,871.—POCKET SUN SHADES.—James W. Browne, N.Y.City.

1st, I claim the annular folding sun shade constructed substantially as herein set forth and for the purpose specified.

2d, In combination with the annular folding sun shade, the elastic inner edge, substantially as herein set forth for the purpose specified.

65,872.—AIR PUMPS FOR MARINE ALARMS.—Samuel G. Cabell, Quincy, Ill.

I claim the double acting air pump constructed substantially as described and charged with a dense fluid packing in combination with the draft and blast whistles, G, I, substantially as and for the purpose set forth.

65,873.—COPYING PRESSES.—Samuel G. Cabell, Quincy, Ill.

I claim the slotted eccentric, E, and roller, a, combined and arranged with relation to the platen, G, and bridge, H al constructed and operating substantially as herein set forth.

65,874.—STEAM GENERATOR.—Thomas S. Clogston, Boston, Mass.

I claim a boiler or steam generator composed of one or more generators, A, in which the upright or circulating flues steam chamber or chambers and lower arched flue are arranged substantially in the manner herein specified.

I also claim the combination with the boiler or steam generator, of the tubular casing surrounding the fuel supply door, substantially as and for the purposes set forth.

65,875—CULTIVATOR.—B. C. Cochran T. W. Cochran, and J. M. Cochran, Pana, Ills.

1st, We claim the metallic frame, D, with seat, E, plates, a a, plow frames, G G, and plows, i i, all constructed, arranged and operating in the manner and for the purposes herein specified.

2d, The shovel frames, G G, arranged with rods, H H', and m, for shifting the loops. b b, and levers, F F, for elevating the shovels in the manner as set forth.

65,876.—CARRIAGE.—Caleb Conderman, Hornellsville, Ills.

I claim the springs, E, in combination with the body or frame, A, substantially as and for the purpose described.

65,877.—RICE CULTIVATOR.—George W. Cooper, Ogeechee, Ga., assignor to himself and James V. Jones, Herndon, Ga.

1st, I claim the combination and arrangement of the braces, A B B', and the braces, G G, substantially as and for the purpose described.

2d, The method above described of fastening the teeth, E E E, to the beams by two bolts, situated obliquely to the grain of the wood substantially as and for the purpose specified.

3d, The inclining and bending of the cultivator teeth, E E, outward and backward upon the point of attachment to the beam, A B B', substantially as and for the purpose described.

65,878.—MEAT MANGLE.—G. A. Cover, Macomb, Ills.

I claim a meat mangle, consisting of the corrugated roller, R, provided with the cogs, c, and the sliding plate, B, provided with the cogs, a, and having its surface roughened when arranged to operate as described.

65,879.—MANUFACTURE OF BELTING.—James B. Crane, Dalton, Mass.

I claim as a new article of manufacture a belt for machinery formed of paper with or without cloth substantially as herein shown and set forth.

2d, The use of paper for belt-lacing when formed substantially as herein described.

65,880.—PURIFICATION OF COAL GAS.—Alexander Angus Croll, London, England.

I claim the employment in the purification of coal gas of wood or vegetable matter when carbonized substantially as herein described.

I also claim the employment of sulphate of lime in combination with the said carbonized matter, substantially as and for the purpose described.

65,881.—CHEESE VAT.—J. H. Crumb and L. Sears, De Ruyter, N.Y.

We claim the employment of cast iron heaters, B, in combination with pipe, b, hot water jacket, c, and milk vat, C c, constructed substantially as and for the purpose set forth.

The float, f, in connection with supply pipe and valve, d, e, heaters, B, and milk vat, C, as and for the purpose herein described.

65,882.—CAR COUPLING.—Geo. E. Cuming, La Fayette, Ind.

I claim the combination in an automatic car coupling of the draw head, A, hinged piece, B, stirrup, C, and spring supporting the same with the shackle bar, D, said parts being respectively constructed and arranged substantially as set forth.

2d, The draw head, A, when constructed with an opening through its lower side at A2, for the escape of the shackle bar substantially as described.

3d, The hinged piece, B, when constructed and used in combination with a draw head and shackle bar substantially as described.

65,883.—COMPUTING MACHINES.—A. W. Davies, Cleveland, O.

1st, I claim the series of reciprocating cams, H, and pawls, G, in combination with the ratchet wheels, F, and pin, a, arranged and operating conjointly with the endless chains, J, substantially as and for the purpose set forth.

2d, The lever, M, and pawl, G, as arranged in relation to each other and the ratchet wheel in disengaging or breaking the connections of one chain from the other for the purpose set forth.

3d, The endless belt or chain composed of sections corresponding to the faces or sides of the master wheels and so arranged as to operate conjointly with the figure wheels substantially as and for the purpose specified.

65.884,—MODE OF CONDENSING NOXIOUS VAPORS FROM LARD RENDERING, &c.—Samuel Davis, New York City.

1st, I claim the arrangement of cistern, A, the coil, B, and the pipes, C E D, and F, in combination with a kettle or boiler for the purposes herein described.

2d, Discharging a stream of water into the discharge pipe of a boiler for the purpose of increasing the draft from the boiler substantially as described.

65,885.—STEAM ENGINE GOVERNORS.—Thomas S. Davis, Jersey City, N. J.

I claim the combination of the plate, G, having a scroll H, with the bar, I, pin, a, arranged to operate across or at right angles or nearly so to the same, substantially as and for the purpose described.

65,886.—INSULATORS FOR TELEGRAPH WIRES.—Alfred B. Day, Oak Creek, Wis.

I claim the lugs, B and F, made of glass or other suitable non-conducting material in combination with the wooden plug, C, on the inside of the cast iron cylinder, A, all made and operating substantially as herein shown and described.

2d, So constructing the shell, A, that the cap, G, can be held down by the cross head, I, when the insulator is attached to the same all as herein shown and described.

65,887.—TREADLE FOR SEWING MACHINES AND OTHER PURPOSES.—Noel B. Devol Marshall, Ill.

I claim the ratchet wheel, H, secured to the crank shaft, B, of a sewing machine arm, I, having spring pawl, 12, pitman rod, K, supplementary treadle, J, and spring, M, or its equivalent when all combined and arranged together so as to operate substantially as and for the purpose described.

65,888.—ROOF FOR RAILROAD CARS.—Charles Dummeldinger, Cleveland, Ohio.

I claim the stay bands, E, tubular ends, C, as arranged in combination with the sheath, F, and car roof, A, for the purpose and in the manner set forth.

65,889.—COMBINED SEWER, PLANTER AND CULTIVATOR.—Daniel Duncan and E. R. Ridgley, Olney, Ill.

We claim the shaft, G, having the fixed armature, H, working the secondary bottom of the seed box, D, and having the sliding armature, K, regulated by means of the lever and treadle, I, substantially as and for the purpose described.

2d, The ring, F, on the end of the roller, E, provided with projecting arms f f f f, substantially as described.

3d, The division of the shaft, M M', to which are attached the drill teeth, into two equal parts M and M,' independent of each other and regulated by means of their respective treadles, n, n', substantially as and for the purpose described.

4th, The combination and arrangement of the spring L, the secondary bottom of the seed box, the shaft, G. with its two armatures, K and H, and the roller, E, having the ring, F, with its arms, f f f f, attached substantially as and for the purpose specified.

5th, The combination and arrangement of the drill teeth attached to the shafts, M M, the seed box, D, and the rollers, E E', substantially as and for the purpose specified.

65,890.—SASH SUPPORTER.—James H. Durham and Sanford Rising, Lafayette, Ind. Antedated December 18, 1866.

We claim a rubber cam having a V-shaped recess, wherein is placed the spring, E, as constructed with screw pivot, G, passing through the collar, C, with a wing, c, for spreading the spring, when arranged between the plates, A. in the manner and for the purpose set forth.

65,891.—WAGON-SPOKE MACHINE.—Chas. C. Dupue, Wayne, Mich.

I claim securing the spoke in position to be acted upon by means of the pivoted dog, R, substantially as herein shown and described.

65,892.—COMPOUND FOR TEMPERING STEEL.—William G. Esser, Milwaukee, Wis.

I claim a compound for tempering steel tools, composed of the above ingredients in about the proportions named.

65,893.—STRAW CUTTER.—Willlam H. Evans, Richmond, Ind. Antedated June 10, 1867.

1st, I claim the rock shaft, E, slotted arm, F, pawls, 1 and 2, and spring, L, in combination with the eccentric wheel, D, and feed roller ratchets, J and K, arranged and operating substantially as set forth and described.

2d, The stop, G, arm or lever, H, and rack, I, in combination with the rock shaft, E, as and for the purpose set forth,

65,894.—FASTENING FOR PAPER COLLARS.—Charles R. Everson, Palmyra, N. Y.

I claim a fastener for collars composed of plate, B, having a clasp, D, hinged to it, and provided with a loop, G, substantially as described.

65,895.—BELTING.—C. J. Fay, Philadelphia, Pa.

I claim the use of and the manner of arranging paper for belts and straps, substantially as described.

65,896.—VEGETABLE LIFTER.—Christopher C. Fellows, Centre Sandwich, N. H.

I claim as my invention the new manufacture of egg or vegetable lifter, made as hereinbefore described, viz.: from one piece of wire bent at its middle, and also bent at or near its two ends in conical spirals or helices, as set forth.

65,897.—DEVICE FOR MEASURING LIQUIDS.—Albert Fickett and Justin C. Ware, Titusville, Pa.

1st, We claim the arrangement of the vessel, B, secured within the tank, A, and used in connection with a valve and stop cock, substantially in the manner and for the purpose specified.

2d, In combination with the above an indicator, arranged as and for the purpose specified.

65,898.—VISE.—Orlando V. Flora (assignor to himself and William A. Collins), Madison, Ind.

1st, I claim the rear jaw, D, constructed substantially as herein described, in combination with the support, B, and sliding bar, C, as and for the purpose set forth.

2d, The front jaw, G, pivoted at its lower end to the lower end of the vertical pin, bearing the nut, F, and fitting in the vertical hole of the sliding bar, C, as herein set forth for the purpose specified.

3d The combination and arrangement of the front jaw, G, short screw, H

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nut, F, and sliding bar, C, with each other, substantially as herein shown and described and for the purpose set forth.

4th, The combination of the key, J, with the end of the sliding bar, C, and with the pivoting pin of the nut, F, substantially as herein shown and described and for the purpose set forth.

5th, The combination of the support, B, sliding bar, C, and jaws, D and G, with each other, substantially as herein shown and described and for the purpose set forth.

65,899.—CHURN.—Conrad George, Ligonier, Pa.

1st, I claim the combination of the double alternating levers, J K L, and the partitioned churn box, A, all arranged substantially as and for the purpose set forth.

2d, I claim arranging the levers J K L, in a diagonal position as shown for the purpose of bringing the working ends of the levers, K L, over the centers of the churn divisions, A A', as and for the purpose set forth.

3d, I claim the combination of the perforated dashers provided with the valves, R R and S S, having the moveevents described, with the partition, B, furnished with the holes, b' b', and beveled slits, c' c', substantially as and for the purpose set forth.

65,900.—CALIPER RULES.—A. W. Goddard, Clinton, Mass.

1st, I claim the blades a a, when arranged as and for the purpose described.

2d, The combined caliper and slide gage rule, when arranged substantially as and for the purpose set forth.

65,901.—LIFE-PRESERVING MATTRESS.—John Golding, New York City.

I claim the life raft constructed as described, consisting of the cork mattresses or floats, secured together by means of the spring hooks a, and staples b, as herein set forth for the purpose specified.

65,902.—WINDOW SASH.—D. R. Gould, Chestertown, N. Y.

I claim the strips C C, secured upon the face of the sash by means of screws, in combination with the grooves d d, in the frame, as and for the purpose set forth.

65,903.—PESSARY.—W. G. Grant, Clyde, Ohio.

I claim a sponge pessary, made of conical shepe A, outside, and provided with the hollow, B, substantially as described for the purpose specified.

65,904.—FLOOR CLOTH.—Thomas Griffin, Roxbury, Mass.

I claim a floor covering or imitation oilcloth, made substantially as herein described.

65,905.—CLOTHES DRYER.—R. Hamblin, Mishawaka, Ind.

I claim the combination of one or more sets or tiers of jointed radial arms D, and the supporting or connecting wires E and F, or their equivalent, with each other, and with the central shaft, A, substantially as herein shown and described and for the purpose set forth.

65,906.—CONVERTIBLE STOVE DOOR AND FENDER.—C. Harris and P. W. Zoiner, Cincinnati, Ohio.

1st, We claim the convertible stove door and fender, substantially as set forth.

2d, The arrangement of convertible door and fender A B F, and hearth depressions D and E, substantially as represented and described.

65,907.—COMBINED MILK RACK AND FRUIT DRYER.—C. B. and G. W. Hart, Victor, N. Y.

We claim the combined milk rack and fruit dryer, provided with loosely pivoted slats forming the shelves, capable of being opened or closed by the wedge bar beneath, the whole constructed and arranged as described, and operating in the manner set forth.

65,908.—ELEVATED RAILWAY.—Charles T. Harvey, Tarrytown, N. Y.

1st, I claim the combination of the rail plates or supports J J, with the rails I, and bars M, when constructed and arranged substantially in the manner and for the purpose herein set forth.

2d, I also claim the elastic plates or springs R, in combination with the rails, constructed and arranged substantially in the manner herein described.

3d, I also claim the platform frame E, with its upright ends or flanges O, in combination with the rails, constructed and arranged substantially as herein described.

65,909.—ELEVATED RAILWAY.—Charles T. Harvey, Tarrytown, N. Y.

1st, I claim the combination with the track of an elevated railroad of an open or transparent floor beneath the rails, so as to allow the transmission of light to the space beneath the railroad, substantially as set forth and described.

2d, I also claim the panels D, in the columns A, for the purpose of closing the openings in the lower part of the said columns, and also to strengthen the columns, substantially as set forth and described.

3d, I also claim the adjustable column A, made in the divisions a b, substantially as described.

4th, I also claim the wedge-shaped rings C, or their equivalents, in combination with the adjustable column A, substantially as described.

5th, I also claim the hollow supporting columns A, in combination with an elevated railroad, substantially as and for the purposes described.

6th, I also claim the pulleys, T, in combination with the supporting columns A, substantially as and for the purposes described.

7th, I also claim the combination of the stay rods V, with the elevatd railroad, said stay rods connecting said railway to the buildings or other supports on the streets, and forming also awning frame supports, substantially as set forth.

8th, I also claim a filling of wood or equivalent material, in combination with said columns, substantially as and for the purposes described.

9th, I also claim the water trough along the track and its discharge pipe in combination with an elevated railway, substantially as and for the purposes described.

65,910.—CARRIAGE.—James Hatfield, Cleveland, Ohio

1st, I claim the centers, a', constructed with radial arms, b, in combination with the bands, B, spoke, d, and keys, f, substantially as and for the purpose described,

2d, The wheel B, spindle C, as arranged in combination with the stays D, boxes E E', for the purpose and in the manner as set forth.

3d, The cross rail K, arm L, links L', and brackets M, in combination with the stay D, and screw G, as and for the purpose substantially as herein described.

4th, The stay D, screw pins, I G, in combination with the spindle C, axle tree A, substantially as and for the purpose set forth.

5th, The adjusting screw O', coupling O, and reach K', arranged substantially as and for the purpose set forth.

65,911.—STEAM PUMP.—William N. Henderson, Philadelphia, Pa.

1st, I claim the arrangement of the pump steam cylinder and housing as described.

2d, The arrangement of a vacuum chamber enveloping the pump canal, substantially in the manner and for the purposes represented.

Third, The arrangement of the cross head arm E, connecting rod, F, eccentric pin shaft K, and slot-headed valve stem J, when constructed and operating conjointly in the manner and for the purposes herein set forth.

65,912.—AMALGAMATOR.—R. W. Howard, Warwick, R. I.

1st, I claim the stationary or fixed pan A, having its bottom provided with radial grooves a, and an annular gutter or trough B, around its edge, in combination with the rotating pan E, fitted within A, and provided at its exterior with flanges I J, and holes h, in its upper part, and provided at its center with an upright hollow hub F, having holes g, in its lower part to admit the pulp down between the bottoms of the two pans, all arranged substantially as and for the purpose specified.

2d, The adjustable jacket G, on the hollow hub, F, operated by the screw H, in combination with the fixed plate K, in the pan E, substantially as and for the purpose set forth.

65,913.—BOLT TRIMMER.—Henry Howe, Oneonta, N. Y.

I claim the cam-shaped sharply-beveled knife C D, pivoted to and in combination with the bar A B, having a hole in B to receive the object to be trimmed by the knife C D.

65,914.—FURNACE FOR BURNING PYRITES FOR THE MANUFACTURE OF SULPHURIC ACID, AND FOR OTHER PURPOSES.—John Hughes, Edgewater, N. Y.

I claim constructing a furnace for burning pyrites or sulphurets of iron, copper, zinc, or other metals, without the aid of fuel, in the form of an inverted truncated cone, without grate bars, and provided with doors on the front side, ranged one above the other from top to bottom, substantially as and for the purpose set forth.

65,915.—CHURN.—Aaron Huyck, Ourtown, Wis.

1st, I claim the bridge D, steppped in loops C C, and provided with the box, F, secured by thumb screws L, all constructed and arranged as set forth.

2d, The bridge D, post N, shafts E I, pinions J G, driver B, and shaft N, constructed and arranged as set forth.

65,916.—EGG CUTTER.—Francis L. King, Worcester, Mass.

I claim the combination of two or more cutter shafts B, having cutters E, attached, with the gearing C D E, arranged and operating essentially as set forth.

65,917.—METHOD OF COVERING WHIPS.—Gamaliel King (assignor to himself and Charles C. Pratt), Westfield, Mass.

1st, I claim a waterproof coating, consisting of the ingredients herein shown and described.

2d, The application of the dissolved caoutchouc, with or without the lead and oil, to a whip, substantially as and for the purpose shown.

65,918.—CULTIVATOR.—Joseph Koehn, Canton, Ohio.

I claim, 1st, The frame A, with diagonal bars A' A', for connecting the shovels D D, when constructed in the manner and used for the purpose set forth.

2d, The arrangement of the lever e, spring t, pin z, in combination with the axle b, rack s, for the purposes specified.

65,919.—MACHINE FOR DRESSING LEATHER.—Charles Korn, Wortsborough, Ind.

1st, I claim the harpeners f and i, when arranged on a sliding block G, either separate or in combination with the cleaner e, all made and operating substantially as herein shown and described.

2d, The knife or knives E, when secured obliquely upon an endless apron, and when arranged in combination with the obliquely set frame F F', and grooved block G, in such a manner that the said block is moved by the knife, substantially as set forth.

3d, The up and down adjustable frame F F', in combination with the sliding block G, and knife or knives E, all made and operating substantially as herein shown and described.

4th, The block G, and knife or knives E, in combination with the spring m, and frame F F', all made and operating substantially as herein shown and described.

5th, The knife or knives E, when arranged on an endless apron A, in combination with the sliding block G, and sharpeners f and i, and cleaner e, all made and operating substantially as herein shown and described.

65,920.—FILING MACHINE.—Thomas H. Lindley, Taunton, Mass.

I claim the combination of the sliding carriages C C', supported in the adjustable bearings B B, and operated by the wheel i, and the adjustable table m, supported and applied substantially in manner and for the purpose as set forth.

65,921.—STEAM VALVE.—Thomas H. Lidford, North Adams, Mass.

I claim the arrangement of the wedge-shaped pieces D and E, with reference to the shaft G, and collars d and e, substantially as described.

65,922.—APPARATUS FOR FORMING MOLDS FOR THE PURPOSE OF CASTING METAL.—Albion H. Lowell, Manchester, N. H.

I claim, in combination with the pattern attached to the plunger, as set forth, the endless chains C, the plates s, the stops or bars t u, the tube or punch c', and the flask F, as above set forth and described and for the purpose of making molds for castings.

65,923—CENTRIFUGAL MACHINE FOR DRAINING SUGAR.—Alexander Mackey, New York City.

1st, I claim the combination with the centrifugal cylinder of a stationary distributer, arranged within the cylinder on one side of it, adjacent to the feed, and operating substantially as specified.

2d, The stationary distributer, C constructed essentially as shown and described, in combination with the centrifugal cylinder B, and arranged in relation thereto as herein set forth.

65,924.—MODE OF FORMING EMERY WHEELS—C. G. Marshall, Florence, Mass.

I claim the use of concrete lime or cement in the formation of emery wheels, substantially as and for the purpose herein set forth.

65,925.—CAR WHEEL.—G. B. Massey, New York City.

1st, I claim a car wheel composed of the disk A, having the solid hub A', with the disk B fitted to turn loosely on the hub and held thereon by the cap C, as set forth.

2d, The car wheel, consisting of the disk B, provided with the flange e, in combination with the disk A, having the solid hub A', said disks A and B, being held together by means of the cap C, substantially as described.

65,926.—MACHINE FOR COATING HATS.—Jules Francois Mathias and Desire Mathurin Legat, Paris, France.

1st, We claim a machine for felting hats, made and operating substantially as herein shown and described.

2d, The hollow shaft K, combined and connected with the shaft H, by means of springs R R, substantially as herein shown and described.

3d, The beating apparatus P, in combination with the spring Q, substantially as herein shown and described.

4th, The arrangement of the valve e, and passage or conduit f, in combination with the channel F and face B, all made and operating substantially as herein shown and described.

65,927,—MANUFACTURE OF ILLUMINATING GAS.—George A. McIlhenny, Washington, D. C.

1st, I claim the prevention of the deposit of carbon in gas retorts by the means described or by any equivalent means.

2d, I claim so arranging the pipes or tubes leading from the retort to the hydraulic main that the mouths of said pipes or tubes can be sealed or unsealed at pleasure.

3d, I claim providing the hydraulic main of a gas factory with two or more pipes for the escape of the coal tar, when said pipes are arranged at different hights and provided with cocks so that the liquid contents of the main may be made to occupy a higher or lower level therein, substantially as and for the purpose set forth.

65,928.—IDENTIFYING BOX.—Levi T. McNieley, Danville, Mo

I claim an identifying box constructed substantially in the form herein described, for the purpose of identifying and aiding in the securing of lost animals and goods.

65,929.—WEATHER STRIP.—Isaac H. McOmber, El Paso, Ill.

I claim the arrangement of the false rim C, with the grooved door cleats H H, and the strip D, substantially as and for the purpose set forth.

65,930.—METHOD OF ADJUSTING ROLLERS.—Samuel M. Mecutchen, Philadelphia, Pa.

I claim the arrangement, substantially as described, of the wedges, sliding bearing b, and set screw f, with a rolling mill, for the purpose specified.

65,931.—BRICK MACHINE.—Jonathan Mills, Des Moines, Iowa, assignor to himself, Lewis J. Brown, Charles S. Spofford, and Henry Van Lutheran.

1st, I claim the horizontal pug tub or mill, constructed and arranged substantially as described, in relation to the mold wheel and the other parts of the machine, substantially as herein shown and described.

2d, I claim dropping back the follower or relieving the brick of pressure, substantially as and for the purposes specified.

3d, I claim the arrangement, substantially as shown and described, by which the apron is operated, as and for the purpose set forth.

65,932.—STUD FASTENING.—Benjamin Moser and David Yellott, Brooklyn, N. Y.

We claim the fastening for buttons, etc., herein described, the same consisting of the arms D D2, and spring or other suitable catch, substantially as specified.

65,933.—LAMP BURNER.—George Neilson, Boston, Mass.

I claim the combination with the jacketed wick tube and rack for adjusting the wick of the cap or deck forming the base of the jacket above the apertures through which the rack pin passes, such deck being depressed so as to constitute a cup which gathers and holds the condensed vapor around and against the wick tube, as and for the purposes herein described.

65,934.—TANNING COMPOUND.—William H. Newby, Seymour, Ind.

I claim the tanning liquid composed of the ingredients in or about the proportions substantially as described.

65,935.—LAMP.—E. D. Norton, Bradford, Pa.

I claim a safety valve constructed and applied substantially as and for the purpose described.

65,936.—MELODEON, ETC.—Amos Nudd, Waupun, Wis.

I claim in combination with the keyboard of a melodeon, or similar reed instrument, the sounding box C, arranged as shown and described.

65,937.—ROCKING CHAIR AND TRUNK.—Thomas Nye, Westbrook, Me.

1st, I claim the movable back a, and folding arms, b, operating as described and for the purposes specified.

2d, The rockers s n, when constructed so as to fold up and also to fold into the recess, substantially as and for the purposes set forth.

3d, The drops e, to hold upright the part h, of the back in the manner and for the purposes set forth.

4th, The double cover m x, when applied to the trunk body to close the recess, substantially as and for the purposes described.

65,938.—CULTIVATOR.—Lorenzo D. Pelton and Joseph Barrow (assignors to themselves and Alexis Green), Harrison, Ohio.

1st, We claim a mode of construction whereby the wheels and secondary beam B, may be detached, and by means of auxiliary bolt holes c, in the handles C, and in the sheaths at c', the handles lowered to a convenient hight to be managed by an operator on foot.

2d, In combination with the elements of the clause immediately preceding, we claim the provision of the described mechanism for lifting the plows from the ground, either temporarily to pass an obstacle, J J', or more permanently to allow of moving the implement on a road or otherwise, F F' h and I, and the position of the seat, which enables the driver to control these levers and manage the plow handle.

65,939.—MACHINE FOR PRODUCING BLAST IN GAS CARBURETERS AND OTHER APPARATUS.—E. A. Pond and M. S. Richardson, Rutland, Vt.

1st, We claim a vessel or case divided into two compartments, communicating with each other at or near the bottom of the vessel.

2d, A hollow shaft or arbor passing through the two compartments, having mounted upon the sides of the dividing partition a series of convolute tubes, and provided on the other side with one or more perforations, the said shaft being connected with suitable mechanism for rotating it.

3d, One or more suitable valves for the admission of air, and pipes for the discharge of the compressed air or gas.

65,940.—MACHINE FOR HEADING CARTRIDGE CASES.—Timothy I. Powers, (assignor to J. P. Fitch and J. R. Van Vechten), N. Y. City.

1st, I claim in cartridge heading machines the combination with the header J, and shell mandrel or series of shell mandrels, h, arranged and operating together substantially in the manner described, of the sectional or divided die, N, arranged to gripe or close round the shells on the mandrel or mandrels before and whilst the shell is being upset and headed, and afterwards to open for release of the latter, essentially as specified.

2d, The combination with the shell mandrels and header of an automatic gage or shell adjuster, arranged so as to set the closed end of the shell to its proper position relatively to the upper or outer end of the mandrel in advance of the action of the header upon the shell, substantially as and for the purpose herein specified.

3d, In combination with a series of shell mandrels and suitable header, a shell take-off, K, constructed to operate essentially as described or in any other equivalent manner.

4th, The combination of the vertical slide, E, divided or sectional die, N N, and header, J, with the locking and unlocking devices operating upon the sectional die, all constructed and arranged substantially as and for the purpose herein set forth.

5th, The fixed way, M, in combination with the lever, q, for closing the sectional die by the movement of the slide, E, which carries the said die, substantially as described.

6th, The slide, L, and stop, o, in combination with each other, and with the levers, q, for opening the die and moving it out of the way of the header, essentially as herein set forth.

65,941.—FORGING APPARATUS.—John Price, N. Y. City.

1st, I claim the combination with the hammer head of a rack spring and sliding catch, substantially as and for the purpose set forth.

2d, Operating the sliding catch, J, by means of the lever, g, which connects and disconnects the power for driving the hammer, the said lever, g, being connected for that purpose to the sliding catch, J, by the arm, a, rock shaft, b, arm, e, and connecting rod or link, f, or by their equivalents in such a manner that the said sliding catch, J, will be thrown inward to catch the hammer when the power is disconnected and drawn out to release the hammer when the power is applied by the lever, g, substantially as and for the purpose set forth.

65,942.—MACHINE FOR GRINDING AND POLISHING.—Thomas Prosser, New York City.

1st, I claim the combination of the wheels, s s', pawls, u u', friction wheels, p h, and screw, I, with the reciprocating carriage for establishing an automatic feed motion, substantially as described.

2d, The reciprocating carriage, F, with its frame or vise, G, made adjustable thereon, parallel or angularly to the axis of the grinding wheel in the manner described.

3d, The friction gear wheels, h p, made adjustable as regards their binding action, one upon the other, substantially as and for the purpose set forth.

65,943.—BRICK KILN.—Stephen D. Rader, Williamsport, Pa.

I claim the peculiar construction and arrangement of furnaces, B B and C C, when used in connection with the kiln, A, as and for the purpose specified.

65,944.—ESCAPEMENT FOR TIME-PIECES.—Herman Reinecke, New York City. Antedated June 10, 1867.

I claim pallets, p p', mounted on the oscillating arbor, b, in combination with the lever, C, lifting spring, f, pins, d e g c, and balance, B, all constructed and operating substantially as and for the purpose described.

65,945.—SECTIONAL MOLDS FOR PUTTING UP BUILDINGS OF CONCRETE AND OTHER MATERIALS.—John R. Richards, Mount Joy, Pa., assignor to himself and Alfred L. Mennez, Cleveland, Ohio.

I claim a series of sectional molds, A B, for the outer face, and another series, H I, for the inner face of walls, in combination with the door, window boxing, M N, strips, K, dovetailed joists, J j, all arranged substantially as united by flanges, F, in the manner shown and described.

In combination with my sectional molds, I also claim the open interstices when made for the admission of carbonic acid gas for the purpose specified.

I also claim the proportions specified for making the composition when introduced between sectional molds, in the manner and for the purpose set forth.

65,946.—APPARATUS FOR TEMPERING STEEL PLATES.—Christopher Richardson, Newark, N. J.

I claim the combination of the plates, C and D, with the screw or screws, K, and the heated chamber, U, or their equivalents, when combined and operated substantially as and for the purpose described.

65,947.—HAND SAW FRAME.—Christopher Richardson, Newark, N. J.

I claim the improved method of holding saws in metallic saw frames, substantially as shown and described.

65,948.—MACHINE FOR COATING PAPER WITH MUCILAGE, ETC.—Henry E. Rile, (assignor to Asa L. Shipman), New York City.

I claim a machine for coating paper, etc., in which are combined a frame carrying a series of brushes whether one or more in number, a platform or table and a reservoir or receptacle for the liquid to be applied by the brushes when all are combined and arranged together so as to operate substantially as described.

65,949.—BURGLAR ALARM.—Henry R. Robbins, Baltimore, Md.

I claim the combination of the frame, A, spring piston hammers, B B, lever catch, E, hinged trigger, D d, and spring, g, constructed and operating substantially as described and represented.

65,950.—DOUBLE SEAMING MACHINE.—J. Rupp, (assignor to himself and Frederick Kieeser), New York City.

1st, I claim the movable slide, d, carrying the supporting plate, f, in combination with the disk, A, constructed, arranged and operating substantially as and for the purpose described.

2d, The arrangement of three or more cone rollers, i, in the annular rim, H, in combination with the rising and falling disk, A, constructed, arranged and operating substantially as and for the purpose set forth.

Third, The clamping roller, p, in combination with the burring roller, o, and disk, A, constructed, arranged and operating substantially as and for the purpose described.

65,951.—LOCOMOTIVE ENGINES.—S. Samuels, Mott Haven, N. Y., and W. J. Brassington, Brooklyn, N. Y., assignors to themselves, William Pitt, and W. B. Burtnett.

1st, We claim the combination with the tank of a locomotive engine tender of an air pump so arranged as to admit of being worked by the engine for the production of a vacuum in said tank, substantially as herein set forth.

2d, The combination with a locomotive engine and its tender of a pump so arranged as to serve either purpose at pleasure of exhausting air from the tank to facilitate the supply of water to the latter, or of forcing water from the tank into the boiler, substantially as herein set forth.

3d, In combination with the water supply pipe, B, and its stop cock, d, the air pipe, D, connected with the pipe, B, in front of the said cock, d, essentially as shown and described.

65,952.—CUTLERY.—William Sanderson, New York City.

I claim a handle formed of a metallic frame, cast with or rigidly united to the bolster, and scales or side pieces, substantially as described.

65,953.—APPARATUS FOR SUPPLYING AIR TO LIFE-BOATS.—Peter F. Schenck, Riceville, N. J.

I claim an apparatus consisting of tubes containing ball valves of different specific gravity, adapted to operate in combination with a closed life-boat, for the purpose of admitting fresh air therein and excluding water therefrom, substantially as described.

65,954.—WOOD PLANING MACHINE.—Frederick Schmidt, Cincinnati, Ohio.

I claim the elongated gains or depressions, e e, in the two parts of a divided cutter, to enable the said parts to be set out in opposite directions, substantially as and for the purposes set forth.

65,955.—MANUFACTURE OF ORNAMENTAL FEATHERS.—F. Emil Schmidt, Hoboken, N. J.

I claim ornamental feathers which have been colored in a printing press, and which are treated substantially as herein shown and described.

65,956.—COMPOSITION FOR ROOFING, PAVEMENTS, WALLS, DOCKS, AND OTHER STRUCTURES.—John See, Baltimore, Md.

1st, I claim the composition formed of the materials named, substantially as and for the purposes herein specified.

2d, Iron ore turnings, borings, or filings in combination with hydraulic cement for the formation of roofing, pavements, walls, docks, water bricks, pipes, and other structures, substantially as and for the purposes herein specified.

65,957.—INSTRUMENT FOR OPENING SHEET METAL CANS.—Frederick Seymour, Nashville, Tenn.

I claim the new article of manufacture, consisting of the guard, F, in the described combination with the shaft, A, handle, B, elbow, C, point, D, and cutter, F, whether stationary or adjustable.

65,958.—ICE PITCHER.—Michael Simons, Middletown, Ct.

I claim the inside bottom, P, and the outside bottom, G, with its devices H and L, when arranged and constructed as herein described and for the purpose set forth.

65,959.—FRUIT LADDER.—Daniel C. Smith, Adrian, Mich.

I claim a fruit ladder as shown and described with bars, H, braces, P, and handle, U, as set forth in the specification and drawings; and in combination.

I claim, secondly, the support, N, or any thing substantially its equivalent for the purposes set forth and described.

65,960.—WASHING MACHINE.—Abram C. Stannard, Rock County, Wis.

1st, I claim straight edged eccentrics, J and J, when made substantially as described and used to hold the working mechanism, I, P and K, of a washing machine to any desired altitude within the washing machine box, A, and the whole combined and operated substantially as and for the purposes described.

2d, The general arrangement of box, A, rollers, S, arranged in frame, R, wash-board O, and operating frame work, M, P, J, K, and U, kept to any desired altitude by means of the straight-edged eccentrics, J and J, when the whole are constructed, arranged and operated substantially as and for the purposes described.

65,961.—CULTIVATOR.—U. T. Stewart, Fayette Co., Tenn.

I claim the arrangement of the spring sword, F, F, and the combination of ploughs and scrapers, B, B, two of the scrapers being chopping scrapers, B, B, so as to perform the work above specified.

65,962.—CYLINDER PRESS FOR EXTRACTING OIL FROM FISH.—J. G. Stoddard and B. F. Gallup, Groton, Conn.

We claim the arrangement and combination of the cylinders, C and D, the apron, B, the hopper, F, and the scraper or chute, G, substantially as described and for the purposes herein set forth.

2d, I claim the recesses, b, in combination with the cylinders, C and D, substantially as and for the purposes specified.

65,963.—SLEEPING CARS.—John Swan, Baltimore, Md.

I claim in a railway car of a series of state rooms, provided with side passage and independent ventilation, the combination and arrangement of reservoir pipes, H, H, and basins, G, in the state rooms, as and for the purpose specified.

65,964.—BED BOTTOM.—T. P. Thompson, Charlestown, Mass.

I claim the combination with the slotted cylindrical sockets and springs contained within the same, of slats having heads or knobs on their end, fitting into the side sockets under the arrangement described, so that while the said slats are capable of a free vertical play, their heads shall at all times be held within the said sockets as specified.

65,965.—TOOLS FOR JEWELING WATCHES.—D. B. Tiffany, Xenia, Ohio.

1st, I claim an adjustable arm through which the cutters work, secured to either side of the vise, substantially as and for purposes set forth and described.

2d, An adjustable arm, d, provided with a set screw, a, and secured to the side of the opposite to the former, substantially as and for the purposes set forth.

3d, The combination of the two adjustable arms with circular tap, e, and nut g, operating as and for the purposes specified.

65,966.—SORGHUM STRIPPER.—George Tollinger, Wrightsdale, Pa.

I claim the construction and arrangement of the ring-plate, C, and braces D, D, supporting the scraper blades, a, a, a, a, which are secured to the yielding spring braces, d, d, d, d, the whole being attached to the board or plank A, all in combination operating substantially in the manner herein described for the purposes set forth.

65,967.—FURNACES.—C. W. Trotter, (assignor Gommenginger & Trotter,) Rochester, N. Y.

1st, I claim the peculiar construction of the main body, A, in connection with the inner body, a, with triangular flues. n, n, n. n, n, all in the manner and for the purpose herein described.

2d, I claim a double radiator, C, connections, o, o, and double damper, k and l, with rod, m, also two tiers of smoke pipes, d, d, d, and e, e, e, all in the manner and for the purpose herein set forth.

65,968.—ROLLERS FOR ROLLING OLD RAILS.—J. P. Verree and W. A. Mitchell, Philadephia, Pa.

We claim in three high rolls series of grooves in each roll, shaped substantially as described.

We also claim grooves of the particular form represented by Figures 1 and 2, produced respectively by the conjunction of the groove of one roll with the groove of another.

65,969.—CHIMNEY COWL.—John A. Waggoner, Kilgore, O.

I claim the wings, A, plate, D, and sides, E, when constructed and arranged in combination with a chimney, as and for the purpose set forth.

65,970.—BEDSTEAD FASTENING.—J. B. Wardwell, Georgetown, D. C.

I claim the mortise plate constructed with a rotating side to close upon the neck of the dovetail tenon of the rail, and to open to permit the withdrawal of the tenon, substantially as described.

65,971.—RING SPINNING FRAME.—Joseph W. Wattles, Canton, Mass.

I claim as my improvement in the ring spinning frame, or machine, the application of the ring, B, to its support rail, A, in such manner that while the spinning of the yarn or thread and the winding of it upon the bobbin, may be in the act of taking place, the ring may be free to be moved and centralized with respect to the bobbin, by the draft of the yarn on the traveler.

I also claim the combination of the screws, g, and the slots, f, or their equivalent, with the ring and its rail and with the ring socket, so formed as to allow the ring to play diametrically as and for the purpose set forth, the purpose of such screws and slots being as herein before explained.

65,972.—HINGES FOR LAMP BURNERS.—Wm. Webb, (assignor to the Scoville Manufacturing Co.), Waterbury, Conn.

I claim the hinge, A, having one of its leaves provided with a projecting rest or stop-piece, D, and made substantially as herein described and for the purpose specified.

65,973.—PRINTER'S INK.—M. Weissberger, St. Paul, Minn.

I claim the printer's ink above described, compounded and used substantially as and for the purposes specified.

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65,974.—GATE.—S. H. Wheeler, Dowagiac, Mich.

1st, I claim the frame, E, with its rocker, A, in combination with the revolving post, D, as and for the purpose herein specified.

2d, The combination of the frame, E, with the gate and its posts and the cleat, x. or its equivalent, as and for the purpose set forth.

65,975.—BED BOTTOM.—Chas. W. White, Cincinnati, Ohio.

I claim the combined arrangement of the two sets of transverse slats, A and C, the springs, B, side rails, D D', and screws, E, as and for the purposes set forth.

65,976.—SEED AND GUANO PLANTER.—Thomas W. White, Milledgeville, Ga.

I claim, 1st, the drum, G, having the internal movable disk, T, bearing the teeth, t' t', and adjusted by set screws or their equivalent, substantially as and for the purpose described.

2d, The saw, H, attached to the drum, G, substantially as and for the purpose described.

3d, The bottom plate, N, substantially as described.

4th, The hinged block, K, operated by the cam, L, substantially as and for the purpose specified.

5th, The combination and arrangement of the drum, G, the movable disk, T, the hinged block, K with the flexible bag attached to it, and the cam, L, substantially as and for the purpose described.

65,977.—MANUFACTURE OF HARVESTER GUARD FINGERS.—W. N. Whiteley, Jr., Jerome Fassler, and O. S. Kelly, Springfield, Ohio.

We claim, 1st, Guard fingers for harvesting machines made by the process and order of manufacture herein described.

2d, A harvester guard finger composed of a central portion or core of soft iron and its entire outer skin or surface of hardened steel, substantially as and for the purpose set forth.

65,978.—NIPPLE SHIELD.—C. H. and J. M. Wilder, New York City.

We claim, 1st, The arrangement of a screen, a, in combination with the nipple shield, A, substantially as and for the purpose described.

2d, The adjustable slide, C, in combination with the screen, a. and nipple shield, A, substantially as and for the purpose described.

65,979.—CLOTHES DRYER.—Hosea Willard, Vergennes, Vt.

I claim the securing of the clothes bars, B, in the stirrups, c, of the bracket by means of oblong staples, d, or their equivalents, to admit of the longitudinal adjustment of the bars in the stirrups, substantially as and for the purpose specified.

65,980.—SPRING HINGE.—Alvah Wiswall, New York City.

I claim the spring, D, combined with the bar, E, arm, C, provided with a friction roller, a, and the hinge, all arranged to operate in the manner substantially as show and described.

65,981.—MECHANICAL POWER.—A. B. Wood (assignor to himself, W. W. Wood, and W. H. Wood), Hamburg, Ark.

I claim the interpostion of intermediate mechanical parts or gearing between the point of direct application of power and the point at which an increase of power is attained and applied for the purpose of increasing the capacity of power of any given motor, engine, or machine, when the same is effected substantially in the manner and by the means herein described.

65,982.—BRUSH.—E. J. Worcester (assignor to himself and Wm. S. Porter), Worcester, Mass.

I claim, 1st, The combination of handle, G, and back, B, with a removable metal connection piece or socket such as described, which can be readily applied to either end of the back of the brush without injuring or defacing the same, for the purposes stated.

2d, The combination of the back, B, and handle, C, with the bent metal socket or connection piece, E, and flanges, a a, substantially as and for the purposes set forth.

65,983.—WAGON BRAKE.—G. S. Ziegenfuss, Doylestown, Pa.

I claim, 1st, The brace, F, in combination with the lock bar, E, and bolts, f, or their respective equivalents, substantially as described.

2d, The pole, H, carrying the lever, K, and rack, h, in combination with the cord, K, pulleys, L l, and lock bar, E, or their respective equivalents, substantially as described.

3d, The combination of two or more independent brakes applied to a wagon or other vehicle, adjusted so as to be brought into play either separately or together, substantially as described.

65,984.—INKING APPARATUS FOR PRINTING PRESSES.—G. W. Wood, Richmond, Ind.

I claim, first, sector plates, E, E1, E2, adjustably arranged in sets for transferring the ink from the fountains and disposing the colors or bands upon the type rollers.

2d, The combination upon one shaft of the sector plates and cam wheels, C C'.

3d, The combination of the ink fountain rollers, a corresponding number of sector plates and a type inking or other receiving roller or rollers.

65,985.—WINDING WATCHES.—C. V. Woerd (assignor to the American Watch Company), Waltham, Mass.

I claim a key having a screw formed upon its shank to work into a screw thread formed in the watch pendant, or in a nut inserted in the pendant, substantially as shown and described.

I also claim forming a key to be directly connected with and disconnected from the pendants, with its means of attachment integral with or projecting from the shank, substantially as shown and described.

Also, the combination of the nut, r, and key, B, arranged substantially as set forth.

Also, making the block or nut, through which the key extends, movable vertically as and for the purpose substantially as described.

65,986.—HOOP SKIRT.—Abraham Trager, New York, N. Y.

I claim the use of ribbed or corrugated wires for hoop skirts, either with or without any kind of coating or covering, as herein described.

REISSUES.

2,647.—MACHINE FOR MAKING NAILS AND TACKS.—Orin L. Bassett, T. R. Bearse and W.B.Wilber. Taunton, Mass. Patented Oct, 9, 1866.

1st, We claim the combination of a carrier or bearer for the tack blank with any one of the cutters, be they more or less in number, used for cutting the tack blanks, when arranged so as to operate substantially in the manner and for the purpose specified.

2d, The carrier or bearer for conveying the tack blanks to the die to be headed, in combination with a forked or other suitable lever, arranged with regard to the said carrier and so as to operate upon it and with the cutter, substantially as and for the purpose described.

3d, The lever, S, pivoted to either a fixed or movable fulcrum, in combination with the carrier, Q, cam shaft, D, forked lever, Y, and cutter, substantially as described for the purpose specified.

2,650.—REVOLVING FIRE-ARM.—Wm. H. Elliot, Plattsburg, N.Y. Patented May 29, 1860.

1st, I claim a fire-arm with revolving barrels which are bored through and chambered so as to be charged at the breech and sustained by two supports, to wit, one point of support being at the center of the breech plate, or at the rear of the breech-loading chambers, and the other forward of said chambers, such construction of barrels and supports obviating the use of a pin passing through the cluster of barrels, of sufficient strength alone to support the same, substantially as set forth.

2d, The arrangement of support, n, in the rear of all the barrels, and support, n', in front of all the barrels, in combination with a series of revolving barrels which are bored through at th ir rear ends, for the purpose of being charged at the breech, substantially as set forth.

3d, The employment of a hammer arranged as specified in relation to the barrels, when used independent of a breech pin or nipple, and in combination with chambers bored through at their rear ends, and with a breech plate, substantially as specified.

4th, The combination of a wedge or cam, j, with a fly, f, for raising the hammer, substantially as specified.

2,651.—FAGOT FOR RAILROAD RAILS.—John Price and Wm. Lewis, Danville, Pa. Patented Oct. 28, 1862.

We claim a form or formed piece for a fagot to be rolled into a railroad rail with flanges forming part of the form piece, projecting downward from each side or edge thereof, and over both sides or edges of the layer or layers directly beneath it, said form piece being intended for the head or tread of the rail and the layer or layers specified to the body thereof, substantially as and for the purpose shown and described.

We also claim a rail road rail made from a fagot constructed substantially as above set forth.

2,652.—CLOTHES WRINGER.—Ann Jane Sargeant, administratrix of the estate of 1. A. Sargeant, deceased, Dayton, Ohio, assignor to Sylvenus Walker, Newark, N. J. Patented July 27, 1858.

1st, I claim the yoke, B, provided with a suitable hitching arm, the said yoke being adapted to be temporarily attached to a wash tub or readily disconnected therefrom as explained, and employed as a bearing for a rotary clamp for wringing clothes.

2d, In the described connection with the yoke, B, the movable clamp, H I J K L, and pawl and dog, P Q, by means of which the said clamp is retained within the yoke, or may be readily removed therefrom at will, to be cleaned or dried.

3d, In the described connection with a rotary clamp for wringing clothes, the hinged and yielding hitching arm, E, for the purposes explained.

2,653.—CORSET SKIRT SUPPORTER.—J. H. Foy and L. H. Foy, Boston, Mass., assignees by mesne assignments of Livinia H. Foy. Patented Sept. 15, 1863. Division 1.

1st, We claim the binding cloth cut bias as described, in combination with the exterior or outer edge of the rim, L, to which the binding cloth is applied as specified, whereby all gathering is avoided, while a corded appearance and a case for the hoop, M, are produced, substantially as set forth.

2d, The combination of laced openings, K K, or either of them, with the front part of the body, I, of a corset open in front, substantially as set forth.

3d, The body, I, open in front and adjustable both in front and the back by means of laced openings, substantially as shown and described.

4th, Forming the curve for the hoop and corded edges, O and P, for the same piece of bias cut cloth, as shown and described.

2,654.—CORSET SKIRT SUPPORTER.—J. H. Foy and L. H. Foy, Boston, Mass., assignees by mesne assignments of Livinia H. Foy. Patented Sept. 15, 1863. Division 2.

1st, We claim protecting and securing the ends of the stiffeners, whalebones or springs, which are inserted in pockets in the body of corsets, by by means of caps, p, the body, flange, and spurs e each of which confine the stiffener or spring in position and prevent its wearing through the fabric, substantially as set forth.

2d, Protecting and securiug the ends of the stiffeners, whalebones, or springs, which are inserted in pockets in the body of a corset by means of metal caps applied to the outside to prevent the said stiffeners from wearing through the fabric, substantially as described.

2,655.—SEWING MACHINE.—James E. A. Gibbs, Midway, Va. Patented Aug. 10, 1858.

I claim the general arrangement of a sewing machine comprising the parts whereby the sewing mechanism is brought into operative relation, substantially as herein shown and described, that is to say, combining with the vibrating needle arm a frame shaped substantially like the roman letter G, as herein shown and described and for the purposes set forth.

I also claim so constructing and combining or arranging and operating a revolving hook or looper with a reciprocating needle as that one loop shall be taken from the needle after the former loop shall have been drawn up, on, along, or over the needle during its advance movement, in the manner and for the purpose substantially as described.

I also claim the conical sleeve or its equivalent, for holding the spool and for revolving therewith, in combination with the adjustable cones, F and G, or their equivalents, for producing the requisite degree of friction upon the conical sleeve spool holder, when constructed and arranged so as to operate substantially in the manner and for the purposes herein set forth.

2,656.—WEAVING CORDED FABRICS.—Wm. Smith, New York City. Patened April 5, 1853. Extended seven years.

I claim the process herein specified of weaving, consisting in the use of stationary warps in combination with the moving warps and filling that form a fabric on each side of such stationary warps, substantially as set forth.

DESIGNS.

2,674.—PLOW CLEVIS.—G. P. Darrow (assignor to James L. Haven & Co.), Cincinnati, Ohio.

2,675.—CLOCK CASE.—A. C. Felton, Boston, Mass.

2,676.—COMBINED HAMMER, TACK DRAWER, WRENCH, ETC.—Anthony Iske, Lancaster, Pa.

2,677.—SOLDIER'S MONUMENT.—Dayton Morgan, Chillicothe, Ohio.

2,678.—POST-OFFICE BALANCE.—W. W. Reynolds, Brandon, Vt., assignor to the Howe Scale Compny.

2,679.—COUNTER SCALE.—W. W. Reynolds, Brandon, Vt., assignor to the Howe Scale Company.

2,680.—COOK'S STOVE.—Samuel Saylor, Philadelphia, Pa., assignor to Francis Buckwalter & Co., Royer's Ford, Pa. Antedated June 4, 1867.

2,681.—TEA OR COFFEE POT.—Geo. Jones, Saugerties, N. Y.

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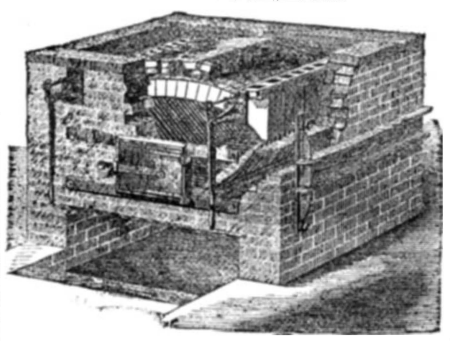

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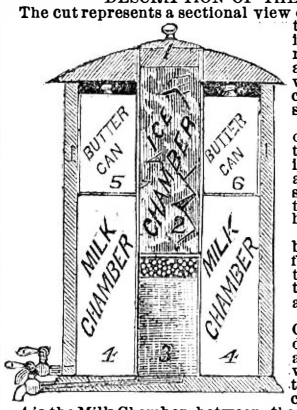
DESCRIPTION OF THE CAN.

The cut represents a sectional view of the can, showing the arrangements inside. The can is round, in shape and appearance like a water cooler, and can be made of any size required.



1 represents the outer rim, a double tin or galvanized iron case, filled with a non-conducting substance, to keep the cold in and the heat out.

2 is the Ice Chamber—a circular tube, fastened to the bottom and passing through the lid, with a separate lid to it.

3 is the Water Chamber, where the drippings of the ice are collected. The water is drawn from this chamber by a cock.

4 is the Milk Chamber, between the outer rim and central ice chamber; the milk is drawn by a separate cock.

5 and 6 are movable cans, made to fit closely around the ice chamber. These cans are to hold butter, berries, vegetables, or any article needed in a family. They can be taken out either separately or together, or left out entirely if required.

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Second, Milk is kept sweet, unadulterated with water, nearly ice-cold, in the warmest weather, in the dining or living room, convenient of access. Buttermilk can be kept as well as sweet milk.

Third, The cans in the upper part of the milk chamber will keep any article used in a family without additional cost for ice.

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For a description of this cooler see Scientific American, April 27, 1867, page 276.

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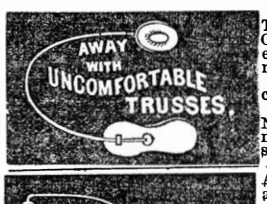

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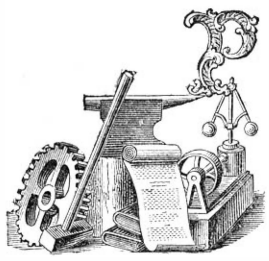

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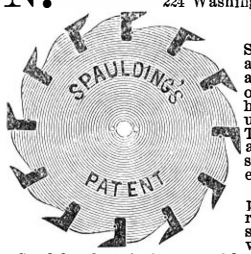

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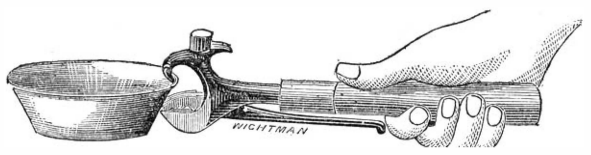

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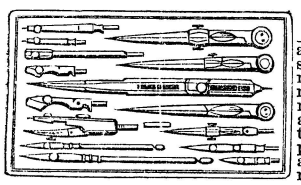

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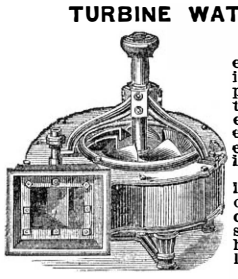

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